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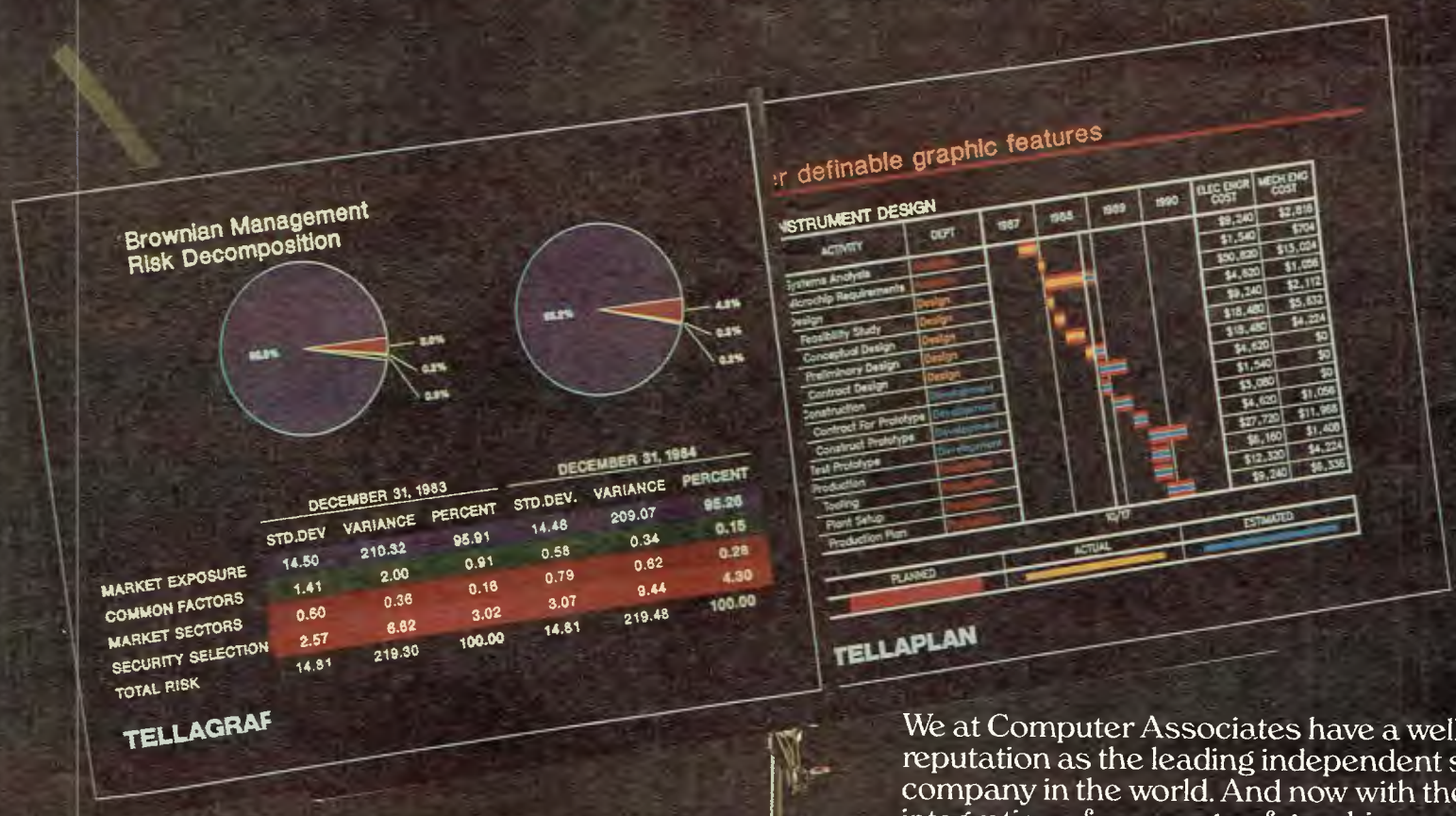

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It's stop, start in this jigsaw puzzle

A computer site without graphics tools is now a rarity — whether it is based on large systems or PCs. Robyn Hughes presents this overview of a confusing market

PRESENTING an overview of the computer graphics market is a bit like trying to put together the sort of jigsaw puzzle where the picture consists of trees reflected in a lake. It is nearly impossible.

With the acceptance of computer graphics as a normal part of most applications, the market is going off in so many directions that the time is coming when suppliers are going to have to concentrate on specific targets.

It is common for a company which starts using computer graphics, maybe to produce a few bar charts for presentations, to discover other applications.

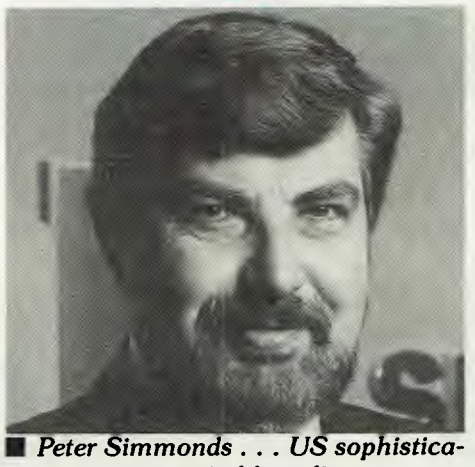
The addition of graphics to software such as Lotus has whetted the appetite of many users and is opening up new markets, particularly for business graphics.

Vendors of personal computer-based graphics systems are saying that things are looking good.

Vendors of highend systems are saying that things are quieter than they would like, but admit that the boom in PC sales can only open up their own markets.

Computer graphics has been accepted as a legitimate tool in most applications and, although acceptance varies from company to company, a computer site without graphics somewhere is unusual.

Because of the enormous diversity of use of computer graphics, it is difficult to pinpoint growth areas.



■ *Peter Simmonds . . . US sophistication is mind-boggling*

However, working on the basis that people who pay to go to a specialised conference are usually serious, we spoke to Ian Chandler, chairman of the West Australian branch of the Australasian Computer Graphics Association, which hosted this year's Ausgraph computer graphics conference and exhibition.

Chandler said three major interest areas stood out: geographic information systems, desktop or computer aided publishing and engineering Cad (computer aided design).

Geographic information systems (or land information systems) are growing in importance worldwide as a means of keeping track of vast amounts of data.

Several Australian authorities have already developed these. For example, Canberra's National Capital Development Commission (NCDC) recently bought a Vax-based system from Arc Cadcentre for work on what it said would rank among the six largest survey mapping and planning information applications worldwide.

NCDC has started with a planning atlas for the whole of the ACT. This provides a record of all planning and will, when complete, hold records of $120,000 blocks of land.

The NCDC said that the system will reduce by 20 per cent the amount of time now required to plan and release development sites.

Similarly, the Royal Australian Navy's

(Continued page 4)

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The market is going in so many directions — with PC-based systems particularly strong — that

Stop, start jigsaw puzzle

(Continued from page 3)

Hydrographic Office is planning to manage the information collected on the 40 million square kilometres of ocean which make up Australia's area of charting and oceanographic responsibility.

The office had ordered a database system from Geovision, based on Hewlett-Packard hardware, to develop what will be known as the Hydrographic Information System (His).

In the desktop/computer aided publishing category, which is the flavor of the month, not only in Australia but in the US, Chandler said that there was great interest at Ausgraph from conference delegates and exhibition attendees.

A large percentage of Ausgraph 87 exhibitors showed desktop publishing-type equipment, both hardware and software, and there was strong interest, particularly from attendees with installed PCs, to add software, scanners and laser printers to their installations.

The rush, according to Chandler, has been encouraged by the high cost of printing, and the ease of use of current systems for preparing inhouse reports and other business material which merge text and graphics.

The third popular category, engineering Cad, was particularly interesting in view of the fact that it fared comparatively badly at last year's Ausgraph in Sydney. It is hard to know whether its popularity in Perth is geographically-based, or whether people are becoming aware it is now affordable.

Chandler found it particularly interesting that, on the whole, streams were evenly balanced as far as attendance goes. This may indicate the acceptance of computer graphics throughout business and government.

"Business graphics" as a category came off fairly poorly, in terms of numbers of session attendees, but this could be because it is starting to be seen not so much as a standalone entity but as part of a total business solution or as part of other applications such as desktop publishing.

Over the past few months, lowend system sales in all computer graphics applications have been healthy.

Peter Greenhalgh, manager, Technical Imports Australia, which specialises in PC-based Cad and business graphics systems, said he had not seen any slowing down of the market in the past 12 months.

He also said that the normal July, post-end-of-the-financial-year slump, had not occurred.

"In the first two trading days in July we took more orders than in any two week period this year," he said. "The sales were of all types of software, particularly our electronics design package, and of mice.

"There did not seem to be any one sector of sales," said Greenhalgh, "and there does not appear to be any change in the education/government/private enterprise mix over the past 12 months."

Proliferation

Greenhalgh believes that personal computers have become popular for graphics because of their low price, and the ease of introducing them into a company.

Buying a mini or a mainframe is a major decision which often has to be made at board level," he said. "But if you just want to micro to sit on your desk, the decision is usually done at a lower level, so it's easy for PCs to proliferate."

Greenhalgh also does not believe that PCs are just lead-ins for bigger systems.

"The market for PC-based graphics systems would not be interested in minis or larger machines," he said. "They want something they can control on their desks.

"When they grow they are not likely to grow into minis or mainframes, either. They will probably grow into a timesharing solution based on 32 bit machines, which still gives them their own desktop systems."

Greenhalgh's views were, to a certain extent, echoed by Harry Hvistendahl, managing director, Dimension Graphics, who said that technical advances in personal computers, particularly in relation to the business graphics market, had seen this sector grow at the expense of the more traditional mainframe solutions.

Hvistendahl feels, however, that when users decide they want more power, they are more likely to continue with personal computers and interface them with the mainframe.

"There is so much development going on in the PC area that some of the larger packages are falling behind," said Hvistendahl.

Dimension Graphics specialises in business graphics systems and markets software for personal computers and minis/mainframes.

Hvistendahl said that sales had been very good in the last quarter, although the company had sold comparatively less mainframe-based software, except for June when they sold more than in the past 11 months. Hvistendahl also feels that desktop publishing has opened up the business graphics market.

"Most desktop packages are weak in graphics," he said. "The sales surge in DTP has brought a backlash of people looking for good graphics to go with it."

Hvistendahl said business graphics have

suppliers must start to look at specific targets

always been seen as not directly productive and tend to be the first to go when budgets are cut.

"Conversely when there is money available the market picks up quickly, and this has happened over the past three months."

Sas Software's marketing manager, Brian Wood, said sales of the company's Sas/Graph business module had been steady.

Sas has not yet released its personal computer-based version of Sas/Graph, but it is expected to be available this year.

"There is a lot of pressure on us for the PC version from our existing users," said Wood. "People want to be able to use graphics at their desks.

"Managers may not have a graphics device allocated to them but would probably have a PC which can provide high quality graphics."

Sas/Graph is different from other software in that it is part of a statistical-based suite rather than a standalone package.

"People use Sas/Graph as an information tool after using Sas on the mainframe for analysis," said Wood. "But in line with requests from users, we have added tools to provide graphics for presentation.

"We are very responsive to user requirements and have noticed several major changes in the market since we started in 1982," he said. "Users are now more demanding and more sophisticated. They want much higher quality of output, resolution and the number of options.

"The quality of the text is also important," he said. "In 1982 you could get away with only having three or four fonts available. Our PC version of Sas/Graph will have a choice of 60.

"And the organisation of the average company has also changed," he said. "In 1982 you had a graphics department; now the users want their own machines on their desks."

The third major business graphics software vendor in Australia, Issco, is now part of Computer Associates.

Peter Simmonds, director of marketing for Computer Associates, said he was recently in the US for Issco Week, an annual event which attracts Issco users from around the world.

Sophistication

"The sophistication of business graphics over there is mind-boggling," he said.

"In Australia we get carried away with PCs, and our biggest problem is to get graphs to portray the true picture, because of a limited amount of data held in a PC compared to a mainframe.

"Management is now becoming aware, that it needs an accurate way of looking at trends, and graphics can provide this.

"PC graphics has whetted the appetite of a lot of managers, so they are now looking for more sophisticated information, and interest is high, which is starting to be reflected in sales.

"With organisations such as Telecom leading the way we expect that the use of business graphics will be more common in Australia by the end of this year.

"Many of the big tenders list graphics as essential, so interest really is picking up."

Mike Barraclough, marketing director of The TCG Group, also said that June had been excellent for sales, adding that he had been surprised that the election announcement had not affected sales.

"Usually an election is a good excuse for not doing anything, but this time it has made no difference," he said.

TCG was one of the first companies in the computer graphics market in Australia and now specialises in graphics hardware such as plotters, digitisers and terminals.

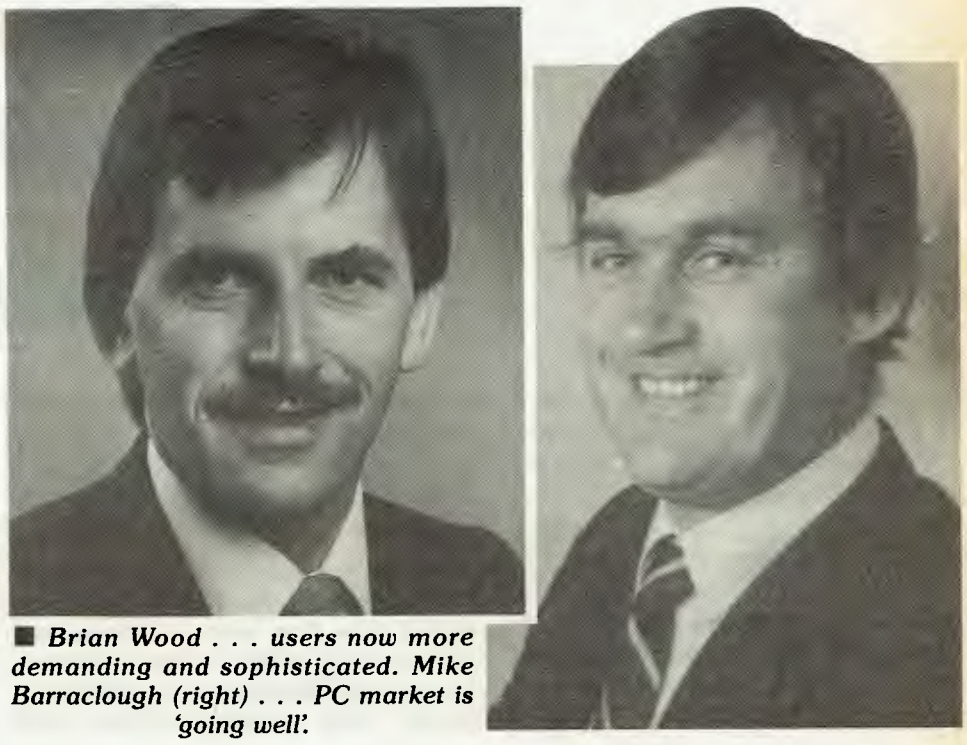
Barraclough agreed that the PC market was going well, particularly for Cad products such as Autocad.

However TCG is now looking more towards the highend of the computer graphics market.

"We are looking at graphics for areas such as industrial design, animation, and simulation applications," Barraclough said.

So the experts' views differ on exactly what direction the computer graphics market will take, but one thing is certain: The days of thinking computer graphics is a fad are over.

● *Robyn Hughes is a Sydney-based freelance journalist specialising in computer graphics. She was one of the founders of Australia's first computer graphics magazine.*



■ ***Brian Wood . . . users now more demanding and sophisticated. Mike Barraclough (right) . . . PC market is 'going well'.***

Architects, designers and engineers went to Washington recently to view a graphics exhibition.

Descon a big draw to diverse delegates

MORE than 22,000 delegates, including a group representing Acads (Australian Computer Aided Design Society), were registered for the A/E/C Systems Show, part of Descon '87, the International High Technology Design and Construction Fair recently held in Washington. The 412 exhibitors filled 13,000 square metres of floorspace and the attendee list was a mix of architects, designers and engineers from companies of all sizes. Many said they were attending the show for the first time to see how computers could help their businesses.

Among the exhibitors, Apple, whose Australian base is North Ryde, NSW, displayed more than twenty hardware and software products from various developers for use on its Macintosh personal computer family. These included products from Challenger Software, Data Tailor, Erez Anzel Software, Visual Information, Versatec (represented in Australia by Anitech of Lidcombe, NSW) and Abvent. Hewlett-Packard demonstrated its plotters for use with the Macintosh II and the Macintosh SE PCs. Autodesk, the US-based Cad software leader, with a recently formed subsidiary in Richmond, Vic, announced, however, that it has no plans to port its software for the Macintosh, although the Apple machines and all other hardware platforms were being closely watched.

Other products announced at the show included an enhanced-facilities management software package from Prime Computer, whose Australian operations centre on North Sydney. Expanded FM Plus 3.0, based on Prime information data management environment software, FM Plus, comprises four models addressing the planning, management and analysis needs of facilities managers and designers. FM Plus operates on all terminals supporting the Graphical Kernel System, and will sell for $US20,000 for the base module on a small system to $US60,000 for the complete module on a highend system.

Prime was also displaying third party products from Arc/Info, whose products are distributed in Australia by Arc Cadcentre in Melbourne, and a document scanner from graphics systems specialists, Tektronix. The Australian arm of Tektronix is in North Ryde, NSW.

Fujitsu America's Information Dsystems Division unveiled its Engineering Library for Modelling (Elm) for structural engineering analysis. The Australian company, in North Sydney, was unable to provide details of the availability of the product for Australian users. It is a PC-based three-dimensional finite element analysis package which sells for $US3,990.

Compressed image

GTX Corp, unrepresented in Australia, announced the GTX 125S Raster Image Editor which can revise scanned drawings in raster form. Operating from a compressed image file allowing for fast and large drawing editing, a typical edit server comprising a Sun Microsystems raster-edit workstation with 141M-bytes of storage and software, costs around $US44,000.

Logigraphics announced Conception 3D, a design package running on the RGS Graphics Subsystems for the IBM PC and PC AT. It is claimed to have applications in manufacturing, engineering, architecture, design, schematics and training and costs $US4,000.

Still on the software front, Sigma Design introduced Release 5.5 of its Unix-based software for architects and building design and management professionals and has renamed its software family Arris. Previously known as Cad Solutions, Arris 5.5 incorporates a new user interface and space planning application called Space Design. Prices for Arris 5.5 start at $US3,000.

A new graphic controller from Control Systems, the Artist 10/1280, claims to boost the resolution of AT Cad systems to 1280 × 1024 pixels. The single slot board includes 2M-bytes of display memory and sells for $US3,795.

Isicad, formerly Calcomp's Systems Division and represented in Australia by Datamatic of North Ryde, NSW, announced a high-performance workstation called Prisma which claims to offer a fully functional Cad solution. Targeted at professionals in the fields of architecture, engineering and facilities management, the workstation supports Isicad's family of applications software and as many as 16 Prisma workstations can be connected to a single host.

At the show, an ACS Telecom 10Cad Plus Network linked a number of exhibits to demonstrate connectivity — they were linked with more than one mile of cable.

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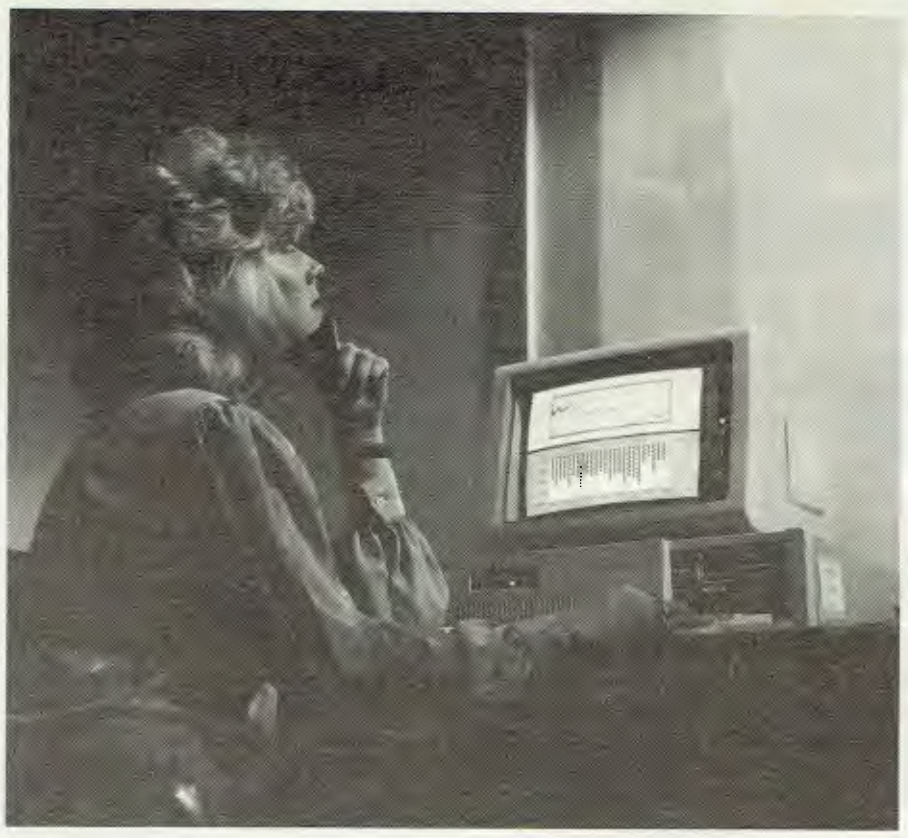


■ *Julie Keating . . . decided on PCs.*

Plotting services: BT plans growth

THE NEED to keep ahead in the competitive financial markets has led merchant banker BT Australia to expand its use of computer graphics to include client services.

BT Australia started using business graphics internally in 1983 and is now also providing graphical financial information to brokers and consultants.

BT Australia, which has offices in Sydney, Melbourne, Brisbane and Perth, is a wholly owned subsidiary of Bankers Trust Company, the eighth largest bank holding company in the US.

In 1983 the Sydney head office installed Mirage business graphics software on a Prime 750 computer for use by company economists.

The system aimed to produce graphs for internal management presentations. Previously graphics had been presented by hand or through a very basic Hewlett-Packard graphing package.

System peripherals at this time were a Tektronix 4105 graphics terminal, a Tektronix 4695 color inkjet copier and a Hewlett-Packard HP7220 flatbed plotter, allowing the production of color hard copy and transparencies.

Two types were produced: management presentation graphics, usually as transparencies, and information graphics, usually plots which were photocopied and distributed.

Financial variables

Basic data came directly from the Prime database or was fed into Mirage via the Tektronix 4105.

This included financial variables such as interest rates, exchange rates and investment trends, and the output was mainly simple line or bar charts.

As BT Australia continued to grow the computer system was too large and the Prime too slow, according to Julie Keating, marketing assistant in BT's financial services division.

"The graphics developed by the economists had been well received and a demand grew from other divisions," she said. "But the economists did not have the time or the resources to service them.

"So the installation had to expand and 18 months ago we moved the graphics on to personal computers, making them accessible to more people.

"We decided on PCs because database management into Mirage was very clumsy," she said.

"The PCs also hold Lotus, Symphony and online databases, and we use Lotus to manipulate data, which is much easier, then download it to Mirage for graphing."

Four IBM ATs have been installed, plus two more Hewlett-Packard HP7550A plot-

Farewell to wad of paper

A graphics system, originally intended only for internal presentations, became so popular at BT Australia's economics division it was expanded to allow other parts of the company to use it as well. Robyn Hughes looks at how the system caught on

MANAGEMENT no longer has time to look through columns of figures, it needs its information in a visual form so that it can quickly identify trends and anomalies, according to Mark Champion, senior systems programmer with NZI Corporation.

He has seen the rapid movement away from conventionally presented spreadsheet information to multicolored charts and graphs and has been instrumental in helping Australia's largest general insurer stay ahead in the visual information age.

"The name of the game is identifying market trends ahead of the competition so that you can plan and implement appropriate strategies. Graphics should be viewed as a management decision making tool that makes strategic planning easier and quicker," he said.

To aid in this, NZI's underwriting services department produces a monthly report package that contains between 40 and 50 graphs and charts. The graphs analyse the marketing performance of the company by region, branch and product and are distributed each month to regional and product managers in the company's 50 offices.

Previously, the information was presented as a thick wad of spreadsheets that took time and effort to digest and analyse.

Now each executive can quickly scan through the graphs and pinpoint trends across a variety of parameters. Alternatively, managers in the company's Sydney, Melbourne and Brisbane offices can log into the company's computer system and view graphic information directly on a monitor.

The ease and speed with which graphic information can be presented results from the combined efforts of a graphics software package, Mirage, and a sophisticated color printer, the Calcomp Colormaster.

NZI's mainframe has a storage capacity of 15G-bytes, which is compressed into 500M-bytes of summary information. This information is then transposed on to an IBM PC where Mirage turns the data into graphic information. The package is also interactive so executives can access information they require in a graphic format.

ters. BT is also looking at a Colormaster for higher quality presentation material.

Mirage is now being used by staff from four divisions within BT Australia — financial services, investment management, foreign exchange and the original economics division.

Investment management produces graphics in the form of transparencies to use in quarterly presentations to the trustees of superannuation funds managed by BT Australia.

The charts show the performance of the funds and the markets over the previous quarter. The trustees are also provided with hard copies of the graphs.

The foreign exchange division monitors currency for the large companies who invest in foreign exchange. These companies are provided with a report each Monday which incorporates graphics showing how worldwide currencies have performed.

"Foreign exchange started using graphics as soon as the personal computers were installed," said Keating. "Previously, because of the pressure of their jobs, it was impossible for them to leave their desks for long enough to go to the Prime for graphing."

Financial Services is the newest user of business graphics, and installed the latest version of Mirage, Version 5.0, in the second week in July.

"Version 5.0 has several advantages over the older versions of Mirage, a major one being that you can now edit text, but with the older versions if you wanted to change a word slide you had to redo it," said Keating.

"Other enhancements we like are a shaded background facility, a symbol library and a facility to produce 3D bar charts."

Financial services hopes to use the software to provide charts to consultants, showing how the market and the dollar are performing.

"We currently provide consultants with this information only in an ad hoc manner over the phone," Keating said. "The regular charts, which have been received very well, will be hung on the wall for easy reference.

"Providing this graphical service is a major advantage in competition."

Economics division still uses the graphs mainly for internal presentations, but sometimes also for presentations to very large clients to indicate trends.

Economics use the graphs in monthly presentations of budget and other government economic statements to staff in Sydney and Melbourne.

"There are several other areas within BT Australia where the use of graphics could be very beneficial," Keating said. "In fact the more people see what is being done here, the more they want it.

The road to

Harry Hvistendahl recalls milestones in the progress from early plotters

TO minimise future shock, computer technology is usually introduced in two distinct stages. In the first stage, where the computer takes over from manual methods, the machine is made to replicate the manual methods as far as possible. At a later stage when the users tire of the resulting inefficiencies, the computer is allowed to tackle the task in a more digital way.

Take, for example, the way computers were introduced to the drawing office as Cad systems. The draftsman, normally equipped with drawing board and pen-and-ink, expected the computer to use the same tools. So early systems made use of pen plotters, which mimic the action of a pen on a drawing board.

There were drawbacks. The artificial hands and arms of the plotter were subject to mechanical problems, and without eyes it could not tell when the ink had run out. Nowadays, in the US especially, pen plotters are trading at a discount. A new bred of digital output devices, such as electrostatic plotters, laser printers, thermal dye plotters and inkjet printers are carrying most of the work. Yet pen plotters are taking a long time to die out.

User interfaces have also been conservative in their development. Ten years were spent correcting the mistake of the punched card. Even so, the underlying fallacy survived a further 15 years — namely, that the correct way for a user to issue commands to a computer is through a typewriter keyboard. Other mistakes are taking even longer to flush out of the system. Cobol and JCL are still with us today, providing extra jobs for interpreters and disentanglers of code.

It is difficult to teach or sell a new concept without some familiar reference. In the first graphics system, Iven Sutherland incorporated a light pen which the user pointed at the screen to input drawings or make choices. Pursued for many years, light pen technology was always easy to grasp, but hopelessly inefficient. Inaccurate to within 1in and ergonomically a semi-crucifixion, light pens have become a curiosity.

Reluctantly, developers had to turn away from the drawing office for inspiration. With World War II not long gone, the fighter pilot was chosen. Graphics screens displayed a cross-hair moved by means of a joystick, and the system was controlled by a function box — a battery of switches and buttons, sometime illuminated, which looked as it belonged in an aircraft cockpit.

Less military inhabitants of drawing offices were placated with another drawing-board lookalike, the digitiser, and committed drawings to the computer by tracing over them with a special stylus. Un-

Global numbers crunched in 3D

A stockbroker and International investment adviser, BZW Meares Ltd, formerly Meares & Philips has chosen the modular package, Open Access II, for use in its research department.

Following a recent association with the UK company Barclays de Zote Wedd (BZW), Mears & Philips is now truly international. The company is situated in Sydney, Melbourne, Canberra, London and New York. It now provides sharebroking services for institutional, corporate and private clients; corporate finance and underwriting; fixed income debt and capital market trading; options and futures trading; arbitrage and finally, comprehensive research.

"The research department is really the number crunching spot in the firm," said Frances Buckle, research analyst. "Before Open Access we drew graphs on bits of paper and people added up columns of numbers."

Access' Spreadsheet is used extensively for analysing earnings capacities of listed companies, theoretical pricing models and graphic presentations. Extensive use of the external channel function, which connects spreadsheets, combined with macros, which record keystrokes, has made the updating of spreadsheets and graphs following changes quick and simple.

"We had a look, a while back, at Lotus and Symphony and a couple of other small packages," said Buckle. "But, OAII was

the mighty mouse

fortunately, as the device or its operator was only accurate to about 0.1in, straight lines came out curved and curves had kinks.

A minor improvement came about with a puck which used cross-hairs instead of a stylus; but this slowed down the operation.

Despite its inaccuracy the tablet found a useful role as a command device. A preprinted menu of commands could be affixed to the pad, and selected at the poke of a stylus. Other menus could be attached as required, and the pad could also be used to control the screen cursor. Operators had soon tired of using a joystick for this, and had tried using track-balls, thumb wheels, and an upside-down trackball known as a mouse.

At this time, researchers were taking their cue from the office environment to provide a machine acceptable for office workers. A concept called Windows, which mimics a bureaucrat shuffling papers across a desk, was combined with the idea of a temporary menu on the screen, operated by a mouse. The crosshair also lost it warlike appearance and took on a recognisable shape, or icon, which varied, depending on the circumstances. As for the input of drawings, this is now handled by feeding them into an intelligent scanner, eliminating the trembling human hand completely.

There were other developments, also centred on removing the human hand from the computer's command interface. Computers can be made to obey spoken (or shouted) commands. But, like their canine counterparts, they tend to obey their master and not strangers.

But at Mit's Architecture Machine Group, 10 years of research into pen-manual output methods is coming to fruition. The command device is a Honeywell Occulometer, which measures the direction in which the operator is looking, and the pupil size, by means of an invisible infrared spot. The display, which occupies one wall of a room, uses a back-lit light-value projector. To activate a window the user stares at a certain portion of the wall; it lights up; a menu of commands is displayed; and a choice is made by looking at it.

Yet the commercial world has taken little part in this kind of research and the Architecture Machine Group only exists thanks to support from the cybernetics technology division of the US Defence Department, which is looking for a quick command interface for fighter pilots. While the free market economy generally ensures that products are produced to fit demand, it may not lead to an optimum result.

Why did it take so long for PC suppliers to incorporate windows, menus and a mouse?

The answer is rooted in the reluctance, even fear, that marketing-driven corporations have of presenting new concepts.

● *Harry Hvistendahl is managing director of Dimension Graphics Pty Ltd.*

A modular package is helping a major stockbroker make sense of raw data

chosen for its ease of learning and use, via windowed menus, and spreadsheet functions adaptable to financial analysis."

"The thing that really tipped the scales, though, in favour of OAII was the graphics," she continued. "The graphics has the higher presentation 3D and we were interested in trying to get a higher quality graphics in the same package, so that we can swap data from the spreadsheet into the graphics without having to re-enter it."

BZW Mears uses this function for its published studies and presentations. Analysis is easily interpreted through the use of 3D graphs, pie charts and simple line graphs.

The company chose the software before finalising hardware purchases. It had had bad experiences regarding lack of support from previous hardware and software vendors, so eventually turned to IBM for its final hardware requirements, because of its world wide service.

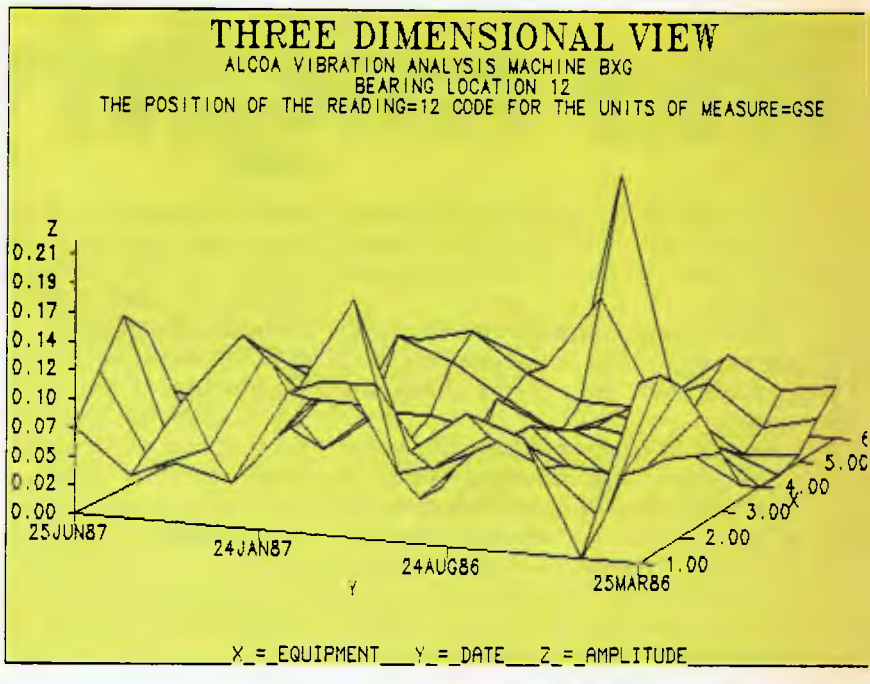
Open Access II being an IBM/compatible product, the company had no problem matching hardware and software

"Software Suppliers, distributors of OAII, have been extremely helpful," said Buckle. "We had a good reception from the company when we made our initial enquiries and so far they have been extremely good with any support we have required."

Software Suppliers has recently launched a network version of Open Access, and BZW Meares has already installed this, at present running on 12 workstations.

Alcoa has found an extraordinary range of graphics uses — based upon a menu-driven system which allows employees to produce graphs quickly after only one demonstration. Robyn Hughes reports

Ways to put staff in the picture



ONCE you start using a business graphics system, you keep finding more and more applications for it, according to Mark Drinnan, a time sharing system programmer in the Information Systems department of Alcoa of Australia.

Alcoa installed Sas Software's Sas/Graph business graphics module at its Perth-based Information Systems (IS) department in 1981, to meet a need for inhouse production of simple graphs for management presentations.

Since then, Sas/Graph has been widely accepted throughout the company and is now being used in a variety of applications covering everything from graphs of monthly budget reports to contour maps for environmental planning and research.

Alcoa of Australia has its head office in Melbourne, with a smelter at Port Henry near Geelong. The bulk of the company's operations, in Western Australia, include the administration centre in Perth and three alumina refineries, at Pinjarra, Kwinana and Wagerup. Bauxite is mined at four separate locations in the Darling Range.

Bureau service

All West Australian and Victorian operation are networked to a central NAS 8083MP processor, and all can access Sas/Graph.

Information Systems is a service department to the rest of the organisation, and designs and implements computer-based systems.

"When I first started with Alcoa we had an IBM 3031 system," said Drinnan, "and the only use of computer graphics within the company was through an outside bureau service which gave us access to Hewlett-Packard plotters for graph production.

"To utilise this service, we had to write several Basic procedures to allow us to produce simple line plots," he said. "And as there was no inhouse service available, graphics use within the company was very limited."

Alcoa then decided to set up a time-sharing service to enable wider access to the mainframe for company endusers.

"We felt this service should be based on Sas software for three main reasons: its statistical capabilities, its data manipulation ability, and its graphics capabilities," said Drinnan.

"The main challenge with putting Sas on the IBM was in making it easily accessible to non-computer staff. We wanted them to be able to use Sas without being exposed to Job Centre language.

"We built a lot of software which auto-

matically set up job cards, file allocations and so on, so this was all transparent to the users.

"The result is a menu-driven system which allows users to produce their graphs fairly quickly," he said. "It can also be used by a wide range of people without computer experience, and this ease of use is probably one of the main reasons for its spread throughout Alcoa."

The Sas software is now running under MVS/XA on the NAS 8083MP, which has 64M-bytes main memory and 40G-bytes disk.

Peripherals for the total system include around 530 screens, spread throughout the Western Australian sites: 113 of these are graphics screens, mainly IBM 3179s and 3279s, and Memorex 2079s.

Hard copy devices include Hewlett-Packard HP 7221 and HP 7550A plotters and Zeta 887 continuous feed plotters, which provide paper output and transparencies.

Also available are several Memorex 2034C copiers which are used to dump images from the Memorex screens on to film, transparency or paper.

Since the original installation, Alcoa has installed several other Sas System modules including Sas/Ets (econometric time series), Sas/IML (interactive matrix language) and Sas/QC (quality control) which is used for producing control charts and displaying variations in graphics form for quality control applications.

According to Drinnan, the original applications of Sas/Graph were for simple line charts, bar charts and pie charts showing factors such as the rise or fall in production figures.

"Initial management acceptance was good once people found it was easy to generate graphics," he said. "Then once we got the network up, the use of Sas/Graph spread very quickly.

"The main users of the graphs are managers, from all divisions of Alcoa," he said. "It is not, however, used much within IS, which is a service group and uses mainly Cobol or PL/1, rather than Sas, for development work.

"We do use Sas/Graph, though, for computer performance evaluation and capacity planning graphs," said Drinnan.

Sas/Graph is used in a very wide range of applications, with one of the most important, according to Drinnan, being the production of charts for safety presentations.

"All plant sites are very safety conscious, and the safety supervisors use Sas/Graph to make charts showing data such as the number of accidents, or lack of accidents, in a given time period. They use these charts in their regular safety meetings with plant personnel.

"The safety supervisors are among our most committed users," he said. "They previously had to quote figures, which just do not have the impact of graphs.

"And as with all other applications, they find it simple to access the information they wish to demonstrate from the database and turn it into graphical format."

Another major user of Sas/Graph is the accounting section. It uses presentation graphics for areas such as monitoring prices, YTD expenditure relative to budgets, Australian and US dollar values, and so on.

Senior management personnel use presentation graphics for regular talks given to employees on the state of the company, to keep them informed on progress.

The research and development section uses Sas/Graph to plot out the results of experiments into more efficient ways of producing alumina.

The environmental department oversees the rehabilitation of mine sites. It conducts research into rehabilitation practices, develops environmental management procedures, for example for dieback and sediment control, and monitors the mining operation's effects on the environment.

The department uses Sas for analysis and Sas/Graph for plotting out the results, and has extended its use of graphics to produce a contour map of rehabilitated mine sites indicating different types of trees and where they were planted.

"Sas has different procedures to allow you to specify in what type of graphical format you want your information," said Drinnan. "For example, GPlot produces line plots after you have input such factors as titles, symbols and axes, and GChart allows the production of pie, bar and block charts after the user fills in the desired parameters.

Flexibility

"There are several options, for example, Sas will automatically scale an axis for you, but you can override this and do it yourself," he said. "You have a fair bit of flexibility, as shown by the environmental mapping application."

Another use of graphics which is just getting under way is that of condition monitoring. At the various operating locations graphs are being used to monitor the wear rate of pipes and bearings, the analysis of oils used in machinery, and equipment vibration.

Plant machinery and fittings are constantly monitored for wear by PC-based equipment, for example a pipe thickness testing system records changes in pipe thickness caused by the passage of chemicals or abrasive slurry.

"Data from the PC is fed into Sas, which extrapolates the figures to give an indication of when the pipe would wear out, then plots this information out using Sas/Graph," said Drinnan.

Other projects under investigation for the use of graphics include a pump performance monitoring system and a thermographic analysis system.

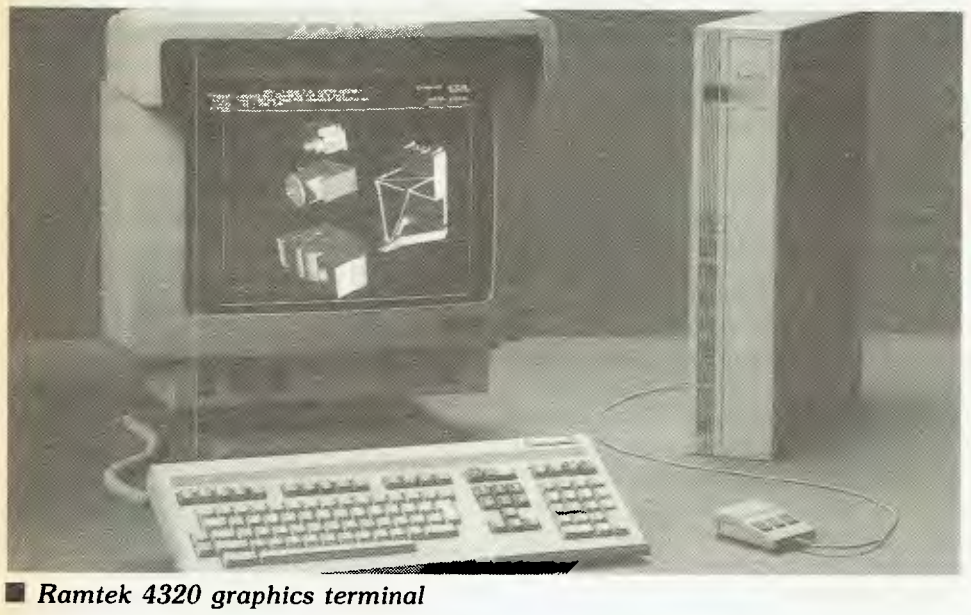
And as a further step in this particular program, Alcoa is continuing the process of integrating its dedicated minicomputer-based process control equipment into the mainframe for increased transfer of data.

"New uses are constantly being found for graphics," said Drinnan, "and the number of users keeps growing as people see the value of using graphics to give immediate impact by demonstrating trends in recorded data.

"And getting started is simple," he said. "Most of our users only needed to be shown how to use Sas/Graph once, then they could go ahead and produce their own graphs."

Terminals must be fast to handle new generation high resolution displays, says Robyn Hughes

Speed vital to good graphics



Ramtek 4320 graphics terminal

THE MOST important factor in computer graphics hardware development in the US is speed, according to Joseph Morris, senior vice-president, marketing, Ramtek Corp.

Morris was in Australia recently to visit Ramtek's new local distributor, Mastatek, which has been established by former employees of Pacific Communications specifically to sell the Ramtek products.

Ramtek, which was founded in the US in 1971, was one of the earlier entries in the field of computer graphics hardware and pioneered the development of computer video display systems that use raster scan technology.

Today it specialises in the design and development of color display systems for use in applications such as Cad/Cam process control and simulation.

According to Morris, even though the trend in computer graphics is towards single-user workstations, there will always be a market for terminals for computer-intensive mainframe-based applications such as simulation.

"There is a large highend market in the US in areas such as process control and Cad, and companies such as Shell use Ramtek terminals within their system," he said. "We are also marketing to areas such as power plants and the Canadian paper mills.

"Government command posts such as in space programs, weather monitoring and satellite imaging are another area in which the market is opening out," said Morris.

"More powerful systems are being developed to cater to these applications. For example, the Ramtek 4300 series has 10 bit planes with two overlays, and can go up to 70,000 transformed vectors/second.

Scientific developments

"Another development that is important to the computer graphics industry is the availability of 2560 × 2480 screen resolution," he said. "It is much too expensive for the general market at around $US50,000 a terminal, but we should soon see that down at around $US5000 to $US10,000.

"In other areas, 1M-byte video Rams are coming, to take the place of the four boards now needed," said Morris. "Much more memory is being mixed into video output; you can keep six to eight pictures behind the screen and call them up instantly.

"Such scientific applications, in particular, need faster and faster speeds, and these speeds becoming available have, in turn, led to further scientific developments. For example, in medical imaging it is now possible to get cross-sections of the body as well as straight cuts."

Morris said the systems available in the late 1970s and early 1980s were on average eight to ten times slower than those of today.

"Memory and microcomputers are getting faster and faster, for example when you quadruple the screen resolution you need all that extra memory to handle the increased picture size," he said.

"Later this year we will be releasing a system which provides gigabytes of storage, instead of megabytes," he said.

Ramtek's processors, using what the company calls data flow technology, do not need to fetch instructions, do not use program counters, and the operations are not dictated by the order of instructions.

The fundamental advantage of this, according to Morris, is that there is no need to go through the sequential fetch, decode and execution of instructions that continually tie up the single-path data bus.

Art of using images

ANTHONY RUSSO

Business graphics can say much more than words or figures, says Joel Orr.

THE role of graphics in business is undergoing a major transition as translation of facts and figures into visual images becomes less mechanical and more automated. Business graphics software can do almost everything a graphic artist can do by hand, and can do it faster and with greater variety. Text charts, for example, which represent the type of business graphics used most often, can be created more easily than typed memos and reformatted with the click of a mouse for overhead transparencies, 35mm slides or paper. This was not acquired overnight. It needed 15 years to capture these skills in code and consolidate them in packages that are both affordable and accessible.

Until recently, only the most expensive business computer graphics software — such as the $A30,000 Tell-A-Graf package for large IBM mainframes, could replicate the typographic qualities of manual work or even produce acceptable stylised arrows, pointers and pictorial embellishments to standard pie, bar and line charts.

High quality

Now, however, products such as Lotus' Freelance Plus, which has a price tag of $US495, and the $US695 35mm Express from Business & Professional Software, do all of that and more — on personal computers that sell for $US3000. The cost of hard-copy output has also dropped sharply, especially for the occasional user.

Hewlett-Packard, the leader in quality multiple-pen plotters, now offers desktop models that interface easily to personal computers for less than $US2000. In the same price range, Xerox provides a color inkjet plotter that produces paper copies and transparencies. For slightly more money, Calcomp offers a thermal-transfer unit called the Colormaster, which provides 200 dot/in output on paper or transparencies. This $US4000 printer comes with a cutsheet feeder and a variety of standard interfaces, including RS-232 and the Centronics parallel port. Software drivers for the leading graph packages are included in the base price.

A few years ago, users could obtain almost any business graphics feature they desired, but not in a single package. For example, they could get freehand drawing, but not in the same package that produced high-quality typography. Today, many programs provide most of the features users

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The telling art of

seek, and selection is often based on the support of specific pieces of hardware, ease of use and price.

Perhaps even more important than the breakthroughs in affordability and ease of use, however, is the fact that computer graphics systems have reached levels of performance necessary to make business graphics palatable for business executives.

A recent article in *The Wall Street Journal* noted that computers churned out more than 3000 million sheets of hard copy in the US last year — 1500 sheets for every man, woman and child in the country. It is a fact that more computer-generated data is being produced than can possibly be assimilated, but graphics can aid in the digestive process. Marvin Patterson, an analyst with Hewlett-Packard, reported that while we absorb verbal and numeric information at up to 1200 words per minute, we are capable of taking in pictorial data at a rate equivalent to 50 million words per minute. Graphics can therefore help us deal with the quantity of information with which we are bombarded.

In 1986, computer-generated images accounted for only 10 per cent of the $US15,000 million spent on visual presentation materials, a small showing that Doug Neal, executive vice-president of DRC, a systems house, attributes to now-rectified performance deficiencies in graphics systems. "There are certain minimal levels of responsiveness, resolution and color that important buyers — senior and upper-middle executives — demand," he said. When those critical limits are not met, these professionals are not interested.

Vast power

The big news this year is that those performance requirements can be satisfied with off-the-shelf components. According to Neal, Compaq Computer's Compaq 386 "draws complex and colorful charts in under two seconds, while IBM Enhanced Graphics Adapter boards provide the minimum required resolution with 16 or more colors." Such developments, Neal contended, will lead to much greater use of graphics at the executive level.

Personal computers have had a great impact on business graphics, and their influence is bound to increase as these machines become more powerful and the graphics software written for them becomes more capable. In fact, some people consider PCs to be already capable of supplanting mainframes for graphics applications. "Everything that can be done on a mainframe," said Morris Samit, a computer graphics consultant, "can also be done on a micro".

There are, however, some gaps remaining and some arguments for keeping the graphics applications within the mainframe environment.

Richard Dym, executive vice-president of Interchart Software said: "Ideally, we should get to a point where the user doesn't care whether he's on PC or mainframe. But data links aren't there yet: there are no fully functional programs for automatically extracting data from all databases. And mainframe companies still don't understand the user interface issues. I think the next hot product will be an expert system that helps users use the vast graphics power that is now at their fingertips."

Alan Paller, president of AUI/Computer Associates, a computer graphics consulting and training company added that for large organisations, centralised graphics on mainframes are usually less expensive, more flexible and easier to control.

"Producing a pie chart on an IBM Personal Computer with a desktop HP plotter is fun and almost easy," Paller said. "But producing 150 charts on that system is almost impossible." Besides, he added, production-quality graphics in large quantities require expensive output devices and trained operators, and these are difficult to provide to the PC user, except by means of a centralised facility associated with a large computer.

There are ways to achieve production quality without sacrificing the convenience of business graphics capability at the PC level, as is demonstrated at the National Aeronautics and Space Administration headquarters in Washington. Nasa installed extensive centralised graphics facilities as part of a comprehensive office automation plan. Two Digital Equipment Corp Vax-11/780 computers run Tell-A-Graf and DEC's All-In-1 to support a network that ties together terminals and PCs on the desks of virtually all knowledge workers, from clerks and secretaries to executives.

David Lavery and Cathy Sonnek of Planning Research, a consulting and engineering firm, who worked with Nasa to create the system, report that All-In-1 has been enhanced to permit users to generate graphics with low-quality output devices. If they want high-quality graphics, they send the chart or graph with a message to a graphic artist over the network. The artist does not have to rekey the chart but can simply enhance it and output it on one of the spooling slidemakers also connected to the Vaxes through the network.

The term "business graphics" covers a broad range of resolution and artistic quality. At the top of the spectrum is business graphics as defined by graphic arts professionals who expect high resolution, multiple colors, professional layout and the ability to produce slides, transparencies and paper output. These charts and graphs are used for boardroom presentations, television and newspapers.

This user is served by systems such as those offered by Genigraphics, Manage-

business images

ment Graphics and Cubicomp.

These systems are based on specialised graphics processors and displays and dedicated minis and micros. Mainframe-based packages, such as Tell-A-Graf and Precision Visuals' Grafmaker, are used by artists and nonartists, under the tutelage of MIS's graphics experts.

An increasingly important category is made up of systems that run generic micros, including systems such as IBM's PC Storyboard and Time Arts' Lumena. These systems are aimed at not only graphic artists but also talented nonprofessionals. They can be used to produce high-quality presentation graphics with the appropriate output devices, but they run on standard hardware configurations. They can also produce electronic slide-shows — sequences of charts that can be displayed like slides in a slide projector — with accompanying wipes, dissolves and other transition effects and even sound on systems that have the suitable hardware.

Also in this group are products that possess strong database management capabilities, such as Mirage from Zenographics, and animation packages, such as Macromind's Videoworks for the Apple Macintosh, Show Partner from Brightbill-Roberts and Co and Videoworks for the PC from West End Film.

Next in line are peer, or management, graphics used by managers in working meetings. Quality of form is not as important as ease of production; the internal graphics of leading PC spreadsheets like Lotus 1-2-3 and Microsoft Excel fall into this category. Paper and overhead projection transparencies are the main forms of output.

Analytical graphics are at the bottom of the scale. They are designed to be seen only by the person producing them; their most important characteristics are speed of production and flexibility. The statistical routines of Sas from Sas Institute, and SPSS from SPSS, both of which run on mainframes, minis and micros, are often used this way, although these packages are capable of producing the quality required for other applications.

● *Joel Orr, a speaker and author on graphics, heads Orr Associates Inc, a computer graphics consulting firm in Great Falls, Virginia. He is a founder of the National Computer Graphics Association.*

Other important types of business graphics include project management charts, such as those used with Pert, the product management methodology that was developed in 1958 by the US naval special projects office for planning and monitoring the Polaris submarine project.

Betsy Riley and Stanford Witcher, from Martin Marietta Energy Systems, used business graphics to reduce from 392 to three the number of man-hours per month spent on Pert project management charts.

The Pert charts were required for monthly presentations made by the outside contractors planning office at Oak Ridge, which is run by Martin Marietta, to the US Department of Energy. Originally, data was frozen each month for 10 days before the presentation to the DoE. A staff of seven, mostly engineers, performed the work, and the average number of man-hours spent each month was 392, many of which were overtime.

Flexibility

When the DoE demanded more timely data, the contractors planning office was at a loss. They did not possess the budget to add people, and the people on the presentation chart team were already working at capacity.

A project management system, written by inhouse programmers and employing some commercial graphics subroutines, saved the division roughly $US800,000 during the seven-year life of the project. The system generates slides on film recorders from data on the division's network of DEC Vaxes.

With the system in place, the time necessary to produce the charts required by the DoE dropped from 10 days to four, and the number of people required fell from seven to one. And that one person required only three hours to create the charts.

Business graphics vendors often have difficulty identifying their markets of which there are three: graphic artists, MIS departments and occasional users. All three groups have varying requirements for flexibility and ease of use. Many products try to address two of these or all three and fall short of usefulness in any of them.

Graphic artists need the flexibility of freehand drawing, simple typesetting, accessible clip art and an easy-to-use human

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interface. They require a system to use as a tool on a regular basis. They will become familiar with it over time, and it must be responsive and consistent.

MIS departments need production tools — software that enables their users to produce presentations quickly and easily and that supports centrally controlled and operated output devices. Seamless interfaces to existing mainframe databases are also important.

Occasional users make up the fastest growing segment of business graphics users. These are mostly middle managers and executives who need charts from time to time but not regularly enough to warrant their learning a complex charting system.

Occasional users must have tools that are easy to learn and remember, since they are not regularly used.

Many of these users also need what Professor John Rockart of MIT calls "exploratory graphics" — charting and graphing tools that are easily applied to data, allowing the user to explore the data's nature.

A recent breakthrough product in this arena is Macspin, a Macintosh-compatible package from D2 Software. Macspin accepts multidimensional data and allows the user to select any three factors for defining points in space. It displays the data as clusters of points in three-dimensional space, with or without a 3-D axis symbol. Analysis is performed interactively by rotating the cloud of points and visually searching for patterns. Rotation motion is smooth and is defined by the user. Any point can be interrogated by touching it with the cursor, which then displays the identified text.

Consultant Samit emphasised the importance of corporate graphics standards. When executives give presentations, their slides make as much of an impression as their clothes do and reflect the organisation they represent. Corporate image should be clearly and consistently presented in the corporation's pronouncements.

Many of the new business graphics systems simplify this by allowing the user to create templates. These are fill-in-the-blanks charts that are laid out and designed to conform to corporate standards. The user simply adds data, and the template formats it into professional-looking graphics output in keeping with the corporate image. The Genigraphics Graftime package for personal computers provides this capability, as do most mainframe- and mini-based systems.

Some system features longed for by early users of business graphics are now commonplace. The often-expressed wish for automatic charts and graphs from spreadsheets and other applications has been satisfied. Lotus 1-2-3, Microsoft Excel, Provue Development's Overvue and other spreadsheets and database packages offer integral charting.

Furthermore, many successful micro-based graphing packages accept Lotus 1-2-3 files as input; Interchart Software's Chartbuster/PC — billed by its vendor as "Tell-A-Graf for the PC" — imports spreadsheets and retains their appearance along with their menu.

PC business-graphics packages that do well with both text and graphics, such as Business & Professional Software's 35mm Express, Interchart's Chartbuster/PC and Computer Associates' Superimage, are the growth products for this year. They can produce both documentation and presentations and are more useful than combinations of single-use packages.

Graphics tips

- Concentrate on summary data, not details.
- Don't use more than five slices in a pie chart.
- Don't have more than seven bars in a bar or column chart.
- When making 35mm slides, the text is too small if you can't read it without magnification on the slide itself.
- Use either a portrait or landscape orientation, not both.
- Don't use underlining for emphasis; instead, use italics, upper-case letters or — sparingly — bold-face type.
- Graphic artists can mix typefaces nicely; the rest of us should stick to a single typeface in a presentation. If your equipment allows it, change sizes for headings.
- Use solid colors to fill graph areas; avoid patterns.
- Black backgrounds make slides and viewgraphs easier to read.
- Use only key words on text charts, not entire sentences.
- If you have to apologise when the slide comes on the screen, don't use that slide.

Joel Orr

Disastrous results

As our definition of computer literacy matures and we stop teaching programming to business majors, we should find time and resources to make Graphics 101 just as important as English 101. We do not all need to become graphic artists, just as we do not all need to become writers. But what we do need is to grasp the basics of design and graphic communication.

For instance, 20 years ago, psychologist George Miller published a monograph called: *The Magic Number Seven, Plus or Minus Two.* In it, he discussed experiments showing that people cannot deal with more than seven items at a time. This piece of information is invaluable in the design of text and pie charts: If the charts contain more than seven items, they are probably too difficult for an audience to follow.

Color is also important for the nonartistic professional. Color has meaning that varies by context; to accountants, for instance, red usually means bad news. Presentations can have disastrous results when such connotations are ignored.

Several years ago, a meeting was held in Seattle. Its title was: "Why is Computer Graphics Always a Year Away?" Pictorial communications have long excited those with an inkling of their power. The old saying suggesting the number of words a picture is worth has earned cliche status because of its broad applicability.

While the widespread application of business computer graphics may still be "a year away", the concept of graphics is now broadly accepted; computers are expected to produce graphics. Although the use and creation of charts and graphics is still not taught to business majors, such pictures are now an important component of most business proposals.

We are becoming aware of the communication power of computer-generated pictures. But, as is true of all languages, comprehension and appreciation are only the first steps toward achieving fluency.

PRODUCT UPDATE

A three-page run-down on the latest hardware and software releases in the field of graphics

High speed on new monitors

A range of microcomputer graphics monitors which is said to pan, zoom and redraw images up to 20 times faster than comparable screens has been launched on the Australian PC market by Comprador Business Systems.

The range, called Xcellerator, is said to be the world's first graphics system for micros to incorporate the third-generation Texas Instruments graphics processor chip, the TI134010.

Comprador has been appointed the exclusive Australian distributor by the UK manufacturer, Cambridge Computer Graphics Ltd.

The Xcellerator range is designed for users of IBM PC AT computers and compatibles who need to produce large drawings, notably architects, engineers, graphic artists and desktop publishers.

It comprises two 19in high-resolution display monitors — a grey scale with eight shades of grey version, and a 256-colour version — and three graphics controller cards.

Comprador Business Systems Pty Ltd, 90-94 Warren Road, Smithfield, NSW 2164. Tel: (02) 681 400.

PM 8155 tops for Cad work

The Philips PM 8155 A3 plotter, intended for business graphics and general use, complements the existing PM 8153 model.

Up to 8 different colored pens can be used to produce business graphics on paper transparent foil. An optional sheet feeder is available.

This multicolor plotter handles a variety of formats up to A3 and maximum plotting area is 287 x 410mm.

It features a 32K-byte buffer.

Philips Scientific and Industrial, 25-27 Paul Street North, North Ryde, 2133. Tel: (02) 925 3333.

Clearer image from Polaroid

Polaroid has introduced a computer image recorder which delivers high resolution color prints, slides or overheads, from IBM-compatible personal computers using Enhanced Graphics Adapter (EGA) boards.

The new Paletteplus system, connected to a computer with an EGA or EGA emulating board (21.85KHz sweep) and graphics software with a Paletteplus driver, can produce 640 x 700 pixel hardcopy, the vendor said.

The system also can be used with Color Graphics Adapter (CGA) or CGA-emulating board-equipped computers.

Polaroid Australia Pty Ltd, 31 Waterloo Rd, N Ryde, NSW 2113. Tel: (02) 887 2333.

GDMS software uses Wang VS

Wang Computer Pty Ltd has introduced, in Australia, the Geographic Data Management System (GDMS) software from Geographic Technology. Designed to operate on Wang VS hardware, the software provides the tools needed for the management and inter-relation of geographic data and tabular information required by governments.

The software provides a bridge between digitally stored maps and conventional data files.

It is priced from $A70,000.

Wang Computer Pty Ltd, 168 Walker Street, North Sydney, NSW 2060. Tel: (02) 925 5806.

Desktop pinch roller plotter

Graphtec has released a A3/Ansi B size pinch roller plotter, the PD9311/F. The PD9311/F has a mechanical resolution of 0.005mm, and a digital servo motor delivers high-speed 44.5cm/sec plotting.

It can accept both A3 and A4 (Ansi B and A) size media, and the F version is equipped with a mechanism which can automatically feed up to 100 sheets, according to the distributors, AWA.

Two command languages, the Graphtec and Hewlett-Packard protocols, provide compatibility with several software packages, and the plotter operates with most host computers through the three standard interfaces.

Functions such as specification of print

(Continued page 20)

PRODUCT UPDATE

(Continued from page 19)

mode, scaling, resetting the plotting origin, setting the plot size and rotation of the plot through 90° can be set via the control panel or specified through software commands.

AWA Technology Group, Unit C, 8 Lyon Park Road, North Ryde, NSW 2113. Tel: (02) 887 7650.

Faster, cheaper easier slides

The Photometric 200PC film recorder produces 35mm slides by turning a personal computer into a desktop slide maker. It is distributed by Dimension Graphics Pty Ltd.

Slides can be produced in any variety of 1000 colors, allowing the user to create vivid effects.

Slides have a resolution of 2048 x 2048. The 200PC is compatible with more than 30 graphics software packages, including Mirage, Lotus 1-2-3, Microsoft Chart, Chartmaster, Picture-it, and Freeland.

To enable a personal computer to drive the Photometric 200PC a Colormetric 20 logic board is installed. This card also allows any standard (or enhanced) color monitor to show images in 1000 colors simultaneously and to simulate 2000 x 2000 boardroom quality resolution, according to the vendor. It enables the user to preview the image created, at its actual resolution, before recording it.

Dimension Graphics Pty Ltd, 201 Miller St, N Sydney, NSW 2060. Tel: (02) 929 5855.

High speed in Apollo 4000

Mentor Graphics, in the US, has recently doubled the performance of its electronic design automation workstations with the introduction of systems based on the Apollo Computer Domain Series 4000 workstation, introduced in June.

Mentor Graphics said it has integrated its design automation products with Apollo 32-bit platforms.

The systems are available under the names: Idea Station, which is for schematic capture and local simulation; Chip Station, for custom very large-scale integration (VLSI) circuit design and layout; and Board Station, for printed-circuit board design.

The company claimed that computer-intensive applications such as its Quicksim logic simulator run twice as fast on the Series 4000 as they do on earlier processors.

Graphics-intensive applications such as the company's Chipgraph circuit layout editor run more than double the speed on the Series 4000, according to Mentor Graphics.

DIN plotter from Graphtec

Graphtec has released a new DIN A4 to A1 (Ansi A to D) size plotter, the PD9111.

The PD9111 which is distributed by AWA, senses the media size, and determines the valid plotting area accordingly. It has a mechanical resolution of 0.005mm, and a switch-selectable programmable resolution of 0.1/0.05/0.025mm. A digital servo motor delivers high-speed 44.5cm/sec plotting, and an acceleration of 2G.

Two command languages, the Graphtec and Hewlett-Packard protocols, provide compatibility with most software packages, and the plotter operates with most host computers through the three standard interfaces, the vendor said.

Measurement and Control Division, AWA Technology Group, Unit C, 8 Lyon Park Road, North Ryde, NSW 2113. Tel: (02) 887 7650.

Desktop art for IBM PC

Graphic art supplier Dynamic Graphics has launched the first in a series of graphic art software packages for the IBM PC XT AT and compatibles, and expanded its Desktop Art packages for the Apple Macintosh, thus confirming its commitment to desktop publishing.

The first Desktop Art/PC package is "Graphics and Symbols I", and contains more than 200 pictograms, seasonal symbols and design elements of all kinds, stored in the personal computer Paintbrush format.

The two new collections in the Macintosh software series are "Borders and Mortices 1", with more than 200 designs for producing coupon and certificate borders; and "Business 1" which contains more than 200 illustrations and symbols.

The company's Macintosh art software packages already include a variety of individual title volumes, such as Graphics and Symbols, Artfolio, Sports, Education, and Four Seasons.

Dynamic Graphics Pty Ltd, 36-38 Parramatta Road, Glebe, NSW 2037. Tel: (02) 660 0211.

'High-quality' chart-maker

COMPUTER Associates has announced Superchart, a PC business-graphics package that generates "high-quality" charts for presentations and reports.

The package transforms data from spreadsheets such as Supercalc R4 or Lotus 1-2-3 into bar, line, pie, area or scatter charts. Users may also create charts from data entered on a keyboard.

As an addon product to Supercalc 4 or Lotus 1-2-3, Superchart enables users to generate standard corporate chart formats to display data from anywhere within their organisations, giving them a consistent appearance. All elements — titles, legends, colors, fonts, and axis types — may be modified to conform to presentation standards.

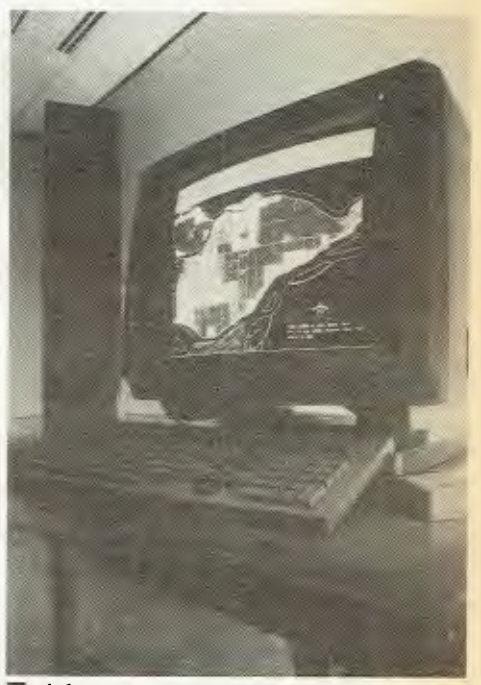
Computer Associates, 55 Lavender St, Milsons Point, NSW 2061. Tel: (02) 923 2066.

Advent station widens range

The Advent graphics workstation has just been launched by Wang Computer Pty Ltd, which further enhances the Wang VS range of products. The Advent consists of a 19in, high resolution (1280 x 1024) color monitor, a control unit, a full function keyboard and a three button mouse for cursor control.

Within the control unit is an industry standard microprocessor integrated with a proprietary bit-slice graphics engine/painter, 1M-byte random access memory for terminal program and data storage, I/O ports for peripherals, and a Wang VS system data link interface. Third party software is available to run on the Advent and is available in Australia, ranging in price from $A26,000 to $A30,000.

Wang Computer Pty Ltd, 168 Walker Street, North Sydney, NSW 2060. Tel: (02) 925 5806.



Advent graphics workstation.

Microcomputers stretching taut

AS desktop publishing, Cad and other programs with heavy graphics demands continue to improve, they are stretching the capabilities of microcomputers. To address the problem, California-based Vista Computer Systems has announced a two-board graphics combination, called the VCS-2000, that boasts very high resolution.

The graphics board set provides 1728-by-2200-pixel monochrome display resolution. The board set, based on the Intel 82786 graphics co-processor chip, allows instantaneous panning over an 8M-byte bit-mapped memory. The boards can have up to 8 megabytes of video memory.

It has a compression rate of 20 million pixels/sec and decompression rate of 16 million pixels/sec. The fast compression and decompression provides rapid screen display generation while conserving hard disk space, the company said.

In addition, screen drivers provided by the company facilitate smooth scrolling, high resolution, and fast drawing on a compatible monitor.

The company also makes available high-resolution 15- or 20in monochrome monitors, in either portrait or landscape orientations. Base configurations of the VCS-2000 two-board set will be priced at $US6500 in OEM quantities.

Vista Computer Systems Inc, 860 Crusoe Circle, Thousand Oaks, CA 91362. Tel: (805) 495 7611.

Color output with reports

COMPUTER Associates has released its graphics reporting option for the IBM MVS version of CA-Top secret, CA-Jars, CA-Dynam/TLMS, CA-Dispatch and CA-Scheduler.

With integrated graphics capabilities, data centre managers can use visual information to review overall system performance, monitor resource and production status, track report distribution, and analyse security measures.

CA-Gro extends reporting capabilities by enabling resource and statistical information to be displayed and printed in a variety of high-quality color graphic formats, including bar charts, pie charts, plot graphics and tables, the company said.

Computer Associates, 55 Lavender St, Milsons Point, NSW 2061. Tel: (02) 923 2066.

Color monitor for graphics

THE Monitronix MX-200 19in color monitor will display up to 1280 × 1024 resolution from a range of graphics cards. It is distributed by Salson Pty Ltd.

Scan rates of 40-70KHz horizontal and 45-90Hz vertical, together with a horizontal retrace time of 3 microseconds and 300 microseconds vertical are offered.

Salson also distributes Generic Cadd 2.0, a full-featured Cad software package for the IBM PC and compatibles.

It is also the base module for a system of Cad tools: Dotplot enables Cad drawings to be produced on virtually any dot matrix printer; Autoconvert allows the exchange of files to and from Autocad; Auto-Dimensioning and Drafting Enhancements increase productivity; Generic Iges gives the IBM PC user access to graphic libraries and capabilities.

Salson Pty Ltd, 49-51 Salisbury Rd, Asquith, NSW 2078. Tel: (02) 476 5944.

HP unveils new jet printer

Hewlett-Packard is set next month to unveil a color ink-jet printer that enables business and Cad application users to produce near letter-quality text as well as color graphics, according to the company's product literature. The $US1395 HP Paintjet prints text at speeds of up to 167 characters per second and color graphics at resolutions of up to 180 dots/in.

HP sees the new printer as the first peripheral that can provide near letter-

Users benefit from Control Data Cad plan

Control Data Corp recently announced the integration of electronic and mechanical computer-aided design (Cad) on a workstation with its Cyber 910 Model 300 system.

At the same time, CDC announced that the Electronic Cad suite of its Integrated Computer Engineering and Manufacturing (Icem) software series can run on the Cyber 910 Model 300 workstations and Cyber 180 departmental and mainframe computers.

Previously, Electronic Cad had been available only for personal computers running Microsoft Corp's MS-Dos, according to the vendor.

"Icem now combines electronic and mechanical Cad in a truly integrated computing environment. Users benefit by not having to re-enter data when moving from electronic to mechanical design, or vice versa," said John Willey, manager of electronics marketing for CDC's computer-integrated manufacturing division.

The software was demonstrated at the Design Automation Conference, in Miami.

Icem electronics software for Cyber 910 Model 300 workstations will be available after September 1, CDC said.

Prices for the three major software products, ED-Schematics, ED-Layout and ED-Router, will be $US10,000 each, CDC said. Prices for the PC versions of the software packages run from $US4000.

The Cyber 910 Model 300 workstation, introduced last year, features three-dimensional real-time graphics and a Unix operating system. Prices start at approximately $US40,000.

Control Data Australia Pty Ltd, 493 St Kilda Road, Melbourne, Vic 3004. Tel: (03) 268 9500.

quality text faster than most dot-matrix printers and higher quality color graphics than most thermal-transfer and ink-jet printers, said a source at HP who confirmed the details of the new product.

Major software developers — including Lotus, Ashton-Tate, Microsoft, Software Publishing, and Autodesk — plan to support the printer in future product releases, HP's documents state.

The printer holds four inks that can be mixed to produce seven basic colors, and with additional software those colors can be further mixed into 330 hues.

A typical text page prints in about 40 seconds, and a full page of color graphics takes about four minutes, the HP documents state. The printer is 10×44×30cm, inches, and weighs 5kg.

Hewlett-Packard Australia Ltd, 31-41 Joseph St, Blackburn, Vic 3130. Tel: (03) 895 2895.

Philips plotter

PHILIPS has released an A3 multicolor plotter designed specifically for business graphics and general purpose applications. The PM 8155 plotter enables graphics output to be produced on paper or overhead transparency foils using up to eight colored pens. The pens may be disposable fibre-tip or metal-tip drafting quality. Maximum plotting area is 287mm x 410mm and the resolution of graphics output 0.05mm. The maximum plotting speed is 50cm a second, but it is freely programmable in increments of 1cm/second to allow adjustment for different pen types. A 32K-byte buffer is also included. The PM 8155 supports both HP-GL and Philips GL software with rear panel selection. An optional sheet feeder, comprising a sheet paper cassette and output stacking tray can be installed without the need for any adjustment or modification.

Philips Scientific and Industrial, 25-27 Paul St, North Ryde, NSW 2133. Tel: (02) 888 8222.

Palette given an output plus

AN enhanced version of Polaroid's Palette computer image recorder is now available in the shape of the Palette Plus system. When connected to IBM personal computers and compatibles with an Enhanced Graphics Adapter (EGA) board and graphics software that has a builtin Palette Plus driver, the Palette Plus is claimed to be capable of producing 640 × 700 pixel hardcopy on paper, 35mm slides or overhead transparency foils. However, the output resolution is governed by the combination of hardware and software used.

The package is priced at $A3800 (excluding tax).

Polaroid Australia Pty Ltd, Eden Park Estate, 31 Waterloo Rd, North Ryde, NSW 2113. Tel: (02) 887 2209.

From PC to screen

SHARP Corp of Australia Ltd has announced the Sharp QA25 Overhead Projector Panel, which allows any information stored on a personal computer to be displayed simultaneously to groups of people at business meetings, conferences and seminars. The QA25 incorporates a liquid crystal display so that when it is placed on top of any transmissive overhead projector, light shines through the LCD and information from the PC is displayed. It plugs into a standard monitor port on an IBM PC XT AT or compatible or an Apple IIe or compatible.

Sharp Corp of Australia Pty Ltd, Huntingwood Drive, Huntingwood, NSW 2148. Tel: (02) 831 9111.

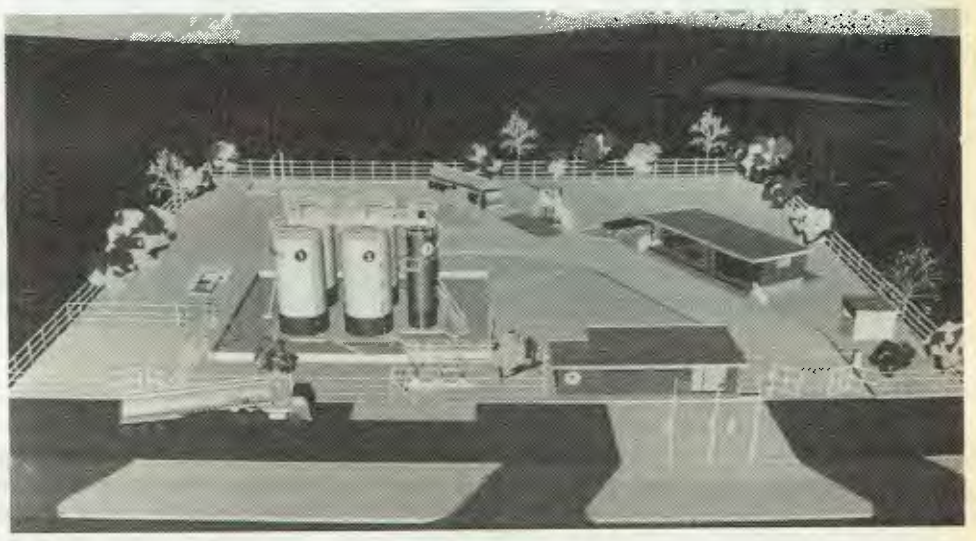
3D model is a prize winner

MOBIL OIL Australia has won second prize in an international computer graphics competition with this three-dimensional model of its bulk plant in Ingham, Queensland.

The company's Intergraph 730 computer-aided design system was used to create the models honored at the annual meeting of the International Intergraph Graphics Users' Group in the US recently.

Working after hours and on weekends, Peter Boulton, Beryl Philp, Hoa Tu, Brian Hill and Bob Payne took about two weeks to draw the model and fill in the colors.

The Cad system automatically produced different perspectives.



SPOTLIGHT ON

IBM PC GRAPHICS SOFTWARE PACKAGES

compiled by
Gillian Sidebottom

BUSINESS graphics software now allows non-specialist and non-professional users to create graphic images of varying degrees of sophistication, resolution and artistic quality in a wide range of formats. And they can do it fast.

Many of the sophisticated business graphics features we see in today's products have been around for a good few years. The major leap forward seen in the past year or so centres on the increasing availability of multiple features in a single package, without compromising the quality of the combined features. Users have also been attracted in increasing numbers by the ease of use and affordability of graphics software.

As penetration of IBM PCs and various compatibles for business applications continues apace, demand for PC-based packages is undergoing corresponding growth. There is a host of products now available from a wide variety of sources, some addressing specialised segments of the market, some giving more basic coverage to general business users.

Professional graphic artists will base their system and software selection on different criteria to a manager wishing to enhance occasional business presentations with inhouse produced slides, hard copy, charts, etc. Whereas resolution, multiple colors, professional layout and consistency will be paramount for the top-endusers, speed of production and ease of use are likely to feature high on the average manager's list of priorities.

Ability to import data from spreadsheets is one other factor liable to enhance a product's attractiveness to business users, as is the ability to give high standards of reproduction in both text and graphics mode.

Although the survey focuses primarily on PC business graphics software, some specialised PC-based Cad packages, designed specifically for professional use in the fields and drafting, have also been included where information was supplied.

Product (Name/Developer)	Country of origin	Price $A incl tax	Terms (purchase/licence)	Product Features: Mode (realtime/online)	System requirements (K-bytes)	Data import	Software compatibility	Report generator	Menu/Mouse/Keyboard driven	Save to disk	Send to printer/plotter	Specific applications	Graphics: Colors	2/3 dimensional	Resolution (dot/in)	Text/Sketching	Bar Graphs	Line Graphs	Pie Charts	Scatter Diagrams	Maps	Shrink/Expand	Cut and Paste	Fonts Available	Library of symbols	Output: Paper Hardcopies	35mm slides	Overhead transparencies	Tutorial provided
Ashton-Tate Pty Ltd — 51 Rawson St, Epping, NSW 2121. Distributed in Australia by Tech Pacific — 119 Ferrars St, South Melbourne, Vic 3205.																													Tel: (02) 868 3600 / Tel: (03) 690 9055
Master Graphics Series:																													
Chart-Master	US	$765	P	R	312	✓	Ascii DIF SWK	-	Me	✓	✓	Business graphics	✓	2D	300	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
Diagram-Master	US	$835	P	R	312	✓	Ascii DIF SWK	-	Me	✓	✓	Business graphics	✓	2D	300	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
Sign-Master	US	$550	P	R	312	✓	Ascii DIF SWK	-	Me	✓	✓	Business graphics	✓	2D	300	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
Map-Master	US	$1895	P	R	512	✓	Ascii DIF SWK	✓	Me	✓	✓	Business graphics	✓	2D	300	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
Autodesk Australia Pty Ltd — 9 Clifton St, Richmond, Vic 3121.																													Tel: (03) 429 9888
Autocad v.2.6 + ADE 3	US	PoA	-	-	640	Ascii DXF IGES	Auto-Shade	-	Me/Mo/K	✓	✓	Engineering/Architecture/PCB design & drafting	✓	2D/3D Opt	Dependent on output device	Sk	-	-	-	-	-	✓	✓	✓	✓	✓	-	-	-
Autosketch	US	PoA	-	-	512	-	Autocad 2.5 and up	-	Mo/K	✓	✓	Line art diagrams/ graphs/plans	✓	2D	Dependent on output device	-	-	-	-	-	-	✓	✓	✓	✓	✓	-	-	-
Autographic Computer Systems — 282 Rokeby Rd, Subiaco, WA 6008.																													Tel: (09) 381 2244
Personal Systems (Cad/Cam)/ Computervision	US	$4500-20,000	L	I	640	-	MS-Dos	✓	Me/Mo/K	✓	✓	Cad/Cam design, development, manufacture	✓	3D	650 x 300 - 1120 x 780	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
Ceanet Pty Ltd — 4th Floor, 56 Berry St, North Sydney, NSW 2060.																													Tel: (02) 922 6311
PC Dogs/Pafec	UK	from $5000	P	O/I	640 + 10M-byte HD	interactive	-	-	Me/Mo/K	✓	✓	Architectural & engineering applications	✓	screen dependent	-	-	-	-	-	-	✓	✓	✓	✓	✓	-	-	-	✓
Preview	Aust	$500	P	O/I	640	Plot file	-	-	K	-	-	Plot preview program	✓	-	as required	-	-	-	-	-	-	-	✓	-	✓	-	-	-	-
Computer Associates Australia Pty Ltd — 8th Level, 55 Lavender St, Milsons Point, NSW 2061.																													Tel: (02) 923 2066
Superimage/Computer Associates	US	PoA	L	R	-	✓	Superchart/Supercalc 4 Lotus 1-2-3	-	Me/Mo/K	✓	✓	Freehand drawing, Editing of charts/graphs Wordchart construction	✓	-	PGA/EGA	✓	-	-	-	-	-	✓	-	✓	✓	✓	✓	✓	✓
Superchart/Computer Associates	US	PoA	L	R	-	✓	Supercalc/Visicalc/ Lotus/dBase III/ Superimage	-	Me/Mo/K	✓	✓	Business graphics	✓	2D/3D	PGA/EGA	-	✓	✓	✓	✓	-	✓	-	✓	-	✓	✓	✓	✓
Computervision Australia Pty Ltd — 55 Falcon St, Crows Nest, NSW 2065.																													Tel: (02) 922 2644
Personal Architectural Design/ Computervision Corp	US	$11,580	-	R	640	✓	Computervision software suite	✓	Me/Mo/K Icons	✓	✓	Architectural design	✓	3D	640 x 480	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Personal Machinist	US	$22,800	-	R	640	✓	Computervision software suite	✓	Me/K Tablet	✓	✓	NC Machining/Milling/ Lathe Operating	✓	3D	640 x 480	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Personal Architectural Drafting	US	$9240	-	R	640	✓	Computervision software suite	✓	Me/Mo/K Icons	✓	✓	Architectural detailing	✓	3D	640 x 480	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Personal Engineer	US	$6900	-	R	640	✓	Computervision software suite	✓	Mo/K Icons	✓	✓	Schematic design	✓	2D	640 x 480	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Personal Designer Finite element Analysis	US	$2910	-	R	640	✓	Computervision software suite	✓	Me/K Tablet	✓	✓	Structural engineers	✓	3D	640 x 480	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Microdraft	US	$5040	-	R	640	✓	Computervision software suite	✓	Me/Mo/K Icons	✓	✓	Mechanical engineers/ designers	✓	2D	640 x 480	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Microcadds Geometric Construction and Detailing	US	$11,760	-	R	640	✓	Computervision software suite	✓	Mo/K Tablet/ Icons	✓	✓	Mechanical engineers/ designers	✓	3D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dimension Graphics Pty Ltd — Ibis House, 2nd Floor, 201 Miller Street, North Sydney, NSW 2060.																													Tel: (02) 929 5855
Mirage/Zenographics	US	$2500	P	R/O	640	✓	EGO Ventura Autumn	✓	Me/Mo/K	✓	✓	Charting database, freeform drawing	✓	2D/3D	Res ind	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Autumn/Zenographics	US	$1200	P	R/O	640	-	Mirage Ventura	-	Me/Mo/K	✓	✓	Graphs/Word charts	✓	2D	Res ind	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Picture it/General Parametrics Corp	US	$1800	P	R/O	512	✓	PicturePak, Ventura 1.1	✓	Me/K	✓	✓	-	✓	2D/3D	Res ind	✓	✓	✓	✓	✓	-	✓	-	✓	✓	✓	✓	✓	✓
Discware — Suite 508, 8 Small Street, Broadway, NSW 2007.																													Tel: (02) 212 6933
Drafix I Plus	US	$599		R	512	✓	Autocad	-	Me/Mo	✓	✓	Design Drafting	64	2D	640 x 400	✓	-	-	-	-	✓	✓	✓	-	Opt	✓	-	✓	-

The Product Spotlight on Graphics Software for IBM PCs and compatibles is based on information obtained from a survey of software suppliers in Australia conducted between June 19 and July 10, 1987. all product details should be checked with suppliers as listed.

Key: Txt / Text; Sk / Sketch
✓ / feature available
- / feature not available, or information not supplied
Opt / feature available as option
Terms: P / Purchase
L / Licence
PoA / Price on Applilcation

Mode: R / Realtime
O / Online
i / interactive
Compatibility: DIF / Data Interchange Format
SYLK / Microsoft Sylk Format
Me/Mo/K / Menu/Mouse/Keyboard driven

Printer: Pr / Printer
LP / Laserprinter
Applications: Cad(d) Computer Aided Design (and Drafting)
Resolution: EGA / IBM Enhanced Graphics Adapter
HGC / Hercules Graphics Card
PGA / Professional Graphics Adapter
CGA / Color Graphics Adapter

Product (Name/Developer)	Country of origin	Price $A incl tax	Terms (purchase/licence)	Product Features: Mode (realtime/online)	System requirements (K-bytes)	Data import	Software compatibility	Report generator	Menu/Mouse/Keyboard driven	Save to disk	Send to printer/plotter	Specific applications	Graphics: Colors	2/3 dimensional	Resolution (dot/in)	Text/Sketching	Bar Graphs	Line Graphs	Pie Charts	Scatter Diagrams	Maps	Shrink/Expand	Cut and Paste	Fonts Available	Library of symbols	Output: Paper Hardcopies	35mm slides	Overhead transparencies	Tutorial provided
Distributed Data Processing Pty Ltd — Level 2, 158 City Rd, South Melbourne, Vic 3205.																													Tel: (03) 615 6711
Attachmode 3270 host graphics program	US	$1245	P	R	-	✓ / from IBM mainframe	PC Paintbrush	-	K	✓	✓	Display of IBM mainframe graphics	✓	-	640 x 350	✓ Will display all graphs from Sas Graph or GDDM	✓	✓	✓	✓	✓	-	-	-	✓	✓	-	-	✓
Genigraphics Aust/NZ — Suite 1, 596 St Kilda Rd, Melbourne, Vic 3004.																													Tel (03) 529 2457
Graftime/Genigraphics	US	$688	P	R/O	384/200K memory av.	-	-	✓	K	✓	✓	Presentation graphics	✓	2D	300	Txt only	✓	✓	✓	-	-	-	-	✓	-	✓	✓	✓	✓
Imagineering — 77 Dunning Ave, Rosebery, NSW 2018.																													Tel: (02) 697 8666
Harvard Presentation Graphics/ Software Publishing Corp	US	$780	P	R	512	✓	PFS-Professional Write/ Harvard Professional Publisher/Lotus Most Cad	✓	Me/Mo/K	✓	✓	Business graphics	✓	2D/3D	DGIS/STD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Versacad/Versacad Corp	US	$5720	P	R	640 + 3M-byte HD	✓		✓	Me/Mo/K	✓	✓	Professional design & drafting	✓	2D/3D	1024 x 1024	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Intergraph Corp — Unit C, 61 Talavera Rd, North Ryde, NSW 2113.																													Tel: (02) 888 9900
Microstation/Intergraph and Bentley	US	$5940	P	O	640	✓	✓	✓	Me/Mo/K	✓	✓	Cadd for architectural mapping, electrical electronic, mechanical & manufacturing applications	✓	2D/3D	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Irvin Graphics Images — 29 Oxford Close, Leederville, WA 6007.																													Tel: (09) 381 6033
Conjure, Conjure Charts, Conjure 3D	Aust	-	P/L	R	512/640	✓	Inter compatible	-	Me/Mo/K	✓	✓	Full color artwork slides & video	✓	2D/3D Opt	Depend on output device Conjure only	Conjure charts only				✓	Conjure only			✓	✓	✓	✓	✓	✓
Microsoft Pty Ltd — 1/17 Rodborough Rd, Frenchs Forest, NSW 2086.																													Tel: (02) 452 5088
Microsoft Chart 3.0	US	-	L	R	256	✓	Lotus/Symphony/ Multiplan	-	Mo/K	✓	✓	Business and scientific graphics	✓	3D	300	Txt	✓	✓	✓	✓	-	✓	-	✓	-	✓	✓	✓	-
Microsoft Windows Draw!	US	$449	-	-	320	✓	Other Windows Packages	-	Mo/K	✓	✓	-	✓	2D	300	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Software Suppliers — 7 Avon Rd, North Ryde, NSW 2113.																													Tel: (02) 888 1955
Open Access II Spreadsheet Access	US	$449	L	-	256	Dif Ascii WKS	Ventura/Open Access II	✓	Me/K	✓	✓	Descriptive graphics	✓	2D/3D	Dependent on graphics card	-	✓	✓	✓	✓	-	✓	✓	-	-	✓	✓	✓	✓
Prodesign II	US	$599	L	-	512	Ascii HPGL	Most software	✓	Me/Mo/K	✓	✓	Cad & drawing	✓	2D/3D	Dependent on graphics card	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Software Wholesalers of Australia Pty Ltd — PO Box 946, Crows Nest, NSW 2065.																													Tel: (02) 957 6686
Stella Business Graphics Stella Systems Inc	US	$345	L	R	256	✓	Most products Ascii DIF Sylk	-	Me/K	✓	✓	Business Graphics	6	2D	EGA/VGC CGA/HGC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Sourceware Pty Ltd — 586 Pacific Highway, Chatswood, NSW 2067.																													Tel: (02) 411 6711
The Magician/ Dr Graphic Research Pty Ltd	Aust	$395	P	R	512	✓	Ascii/Lotus/dBase/ Javelin/Smart/Multiplan	✓	Mo/K	✓	✓	Business Graphics	✓ 16	2D	360/EGA	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	-	-	✓
Technical Imports Australia Pty Ltd — PO Box 176, Crows Nest, NSW 2065.																													Tel: (02) 922 6688
Energraphics	US	$920	L	R/O	384	✓	DIF	-	Me/Mo/K	✓	✓	Business Graphics	✓	2D/3D	EGA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Enercharts	US	$700	L	R/O	384	✓	DIF	-	Me/K	✓	✓	Business Graphics	✓	2D/3D	EGA	✓	✓	✓	✓	✓	-	✓	-	✓	✓	✓	✓	✓	✓
Statgraphics	US	$1800	L	R/O	640	✓	DIF	-	Me/K	✓	✓	Statistical Analysis	✓	2D/3D	-	-	✓	✓	✓	-	-	-	-	-	✓	-	-	✓
Execuvision	US	$240	L	R/O	512	-	-	-	K	✓	-	-	✓	2D	CGA	✓	✓	✓	✓	-	-	✓	✓	✓	✓	-	✓	✓	✓
Concorde	US	$1500	L	R/O	640	✓	DIF	-	Me/Mo/K	✓	✓	Business Presentations Graphs	✓	2D	-	✓	✓	✓	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓
Pizazz	US	$175	L	R/O	32	-	Ail	-	Me/K	✓	Pr	Screen Capture Output	✓	2D/3D	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	-
Laserplotter	US	$230	L	R/O	640	✓	HPGL	-	-	✓	LP	HP plots	✓	2D/3D	300	-	-	-	-	-	-	-	-	-	-	✓	-	-	-
EGA toolkit	US	$740	L	R/O	640	-	-	-	-	✓	✓	Programmers Graphics Sub-routines	✓	-	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	-
Prodesign II	US	$570	L	R/O	640	✓	DIF	✓	Me/Mo/K	✓	✓	2D Cad	✓	2D	-	✓	-	-	-	-	-	✓	✓	✓	✓	✓	-	✓	✓
Draftsman EE	US	$6510	L	R/O	640	-	-	-	Me/Mo/K	✓	✓	2D CAD PCB routing	✓	2D	-	-	-	-	-	-	-	-	-	✓	✓	-	-	-
Protel-PCB	Aust	$942	L	R/O	640	-	Orcad 8 Protel-Schematic	✓	Me/Mo/K	✓	✓	PCB layout	✓	2D	-	-	-	-	-	-	-	-	-	✓	✓	-	-	-
Protel-Schematic	Aust	$800	L	R/O	640	-	Protel-PCB	-	Me/Mo/K	✓	✓	-	✓	2D	-	-	-	-	-	-	-	-	✓	✓	✓	-	-	-
Orcad/SDT	US	$1448	L	R/O	640	-	Pspice. Protel-PCB	-	Me/Mo/K	✓	✓	2D Cad	-	-	-	-	-	-	-	-	-	-	-	✓	✓	-	-	-
Orcad/VST	US	$1500	L	R/O	640	-	-	-	Me/Mo/K	✓	✓	Digital Circuit Simulation Cad	✓	2D	-	-	-	-	-	-	-	-	-	✓	✓	-	-	-
Pspice	US	$2350	L	R/O	640	✓	Orcad	✓	Me/K	✓	✓	Electronic Circuit Simulation Cad	✓	2D	-	-	-	-	-	-	-	-	-	-	✓	-	-	-
Hiwire	US	$1410	L	R/O	640	-	Smartwork	✓	Me/Mo/K	✓	✓	2D Cad	✓	2D	-	-	-	-	-	-	-	-	-	✓	✓	-	-	-
Smartwork PCB	US	$1410	L	R/O	640	-	Hiwire	-	Me/Mo/K	✓	✓	PCB layout Cad	✓	2D	-	-	-	-	-	-	-	-	-	✓	✓	-	-	-
Vision Control International Pty Ltd — Miles St, Mulgrave, Vic 3170.																													Tel: (03) 560 2444
Trevision Picture Power/AT&T	US	$1500	L	R	640 + AT&T Graphics board	-	Intercompatible	✓	Me/Mo/K	✓	✓	Database to image link	✓	2D/3D	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Trevision Image Processing (Tips)	US	$520-2,500	L	R	640 + AT&T Graphics board	-	Intercompatible	✓	Me/Mo/K	✓	✓	-	✓	2D	512/2048	✓	✓	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
Trevision Slide Presentation	US	$330	L	R	640 + AT&T Graphics board	✓	Intercompatible	-	Me/Mo/K	✓	✓	Slide presentation	✓	2D/3D	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Conjure Plus/Vision Control	Aust	$10,000	L	R	640 + 4M-bytes Ram + 85M-bytes HD	✓ / WP files, spreadsheet Intergraph	Tips	-	Pad	✓	✓	Print industry	✓	2D/3D	300	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Image Pro/Media Cybernetics	US	$600-2500	-	R	640 + AT&T board	✓	Conjure tips	✓	✓	✓	✓	Image processing	✓	2D	-	✓	✓	-	-	✓	-	✓	✓	-	-	✓	✓	✓	✓
Conjure Graphics Design System	Aust	$2500-15,000	P/L	R	512/640	✓ / Conjure Business Conjure 3D	Ascii files, WP, spreadsheet	✓	✓	✓	✓	Artwork/Business graphs/Slides/ Pal video	✓	2D/3D Opt	dependent on output device	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Conjure/Conjure Charts/Conjure 3D	See entry under Irvin Graphic Images																												

The Product Spotlight on Graphics Software for IBM PCs and compatibles is based on information obtained from a survey of software suppliers in Australia conducted between June 19 and July 10, 1987. all product details should be checked with suppliers as listed.

Key: Txt / Text; Sk / Sketch
✓ / feature available
- / feature not available, or information not supplied
Opt / feature available as option
Terms: P / Purchase
L / Licence
PoA / Price on Application

Mode: R / Realtime
O / Online
i / interactive
Compatibility: DIF / Data Interchange Format
SYLK / Microsoft Sylk Format
Me/Mo/K / Menu/Mouse/Keyboard driven

Printer: Pr / Printer
LP / Laserprinter
Applications: Cad(d) Computer Aided Design (and Drafting)
Resolution: EGA / IBM Enhanced Graphics Adapter
HGC / Hercules Graphics Card
PGA / Professional Graphics Adapter
CGA / Color Graphics Adapter

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Ground Floor, Fortune House,
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SURRY HILLS, N.S.W., 2010.
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Fax: (03) 212 2245.

It's stop, start in this jigsaw puzzle

A computer site without graphics tools is now a rarity — whether it is based on large systems or PCs. Robyn Hughes presents this overview of a confusing market

PRESENTING an overview of the computer graphics market is a bit like trying to put together the sort of jigsaw puzzle where the picture consists of trees reflected in a lake. It is nearly impossible.

With the acceptance of computer graphics as a normal part of most applications, the market is going off in so many directions that the time is coming when suppliers are going to have to concentrate on specific targets.

It is common for a company which starts using computer graphics, maybe to produce a few bar charts for presentations, to discover other applications.

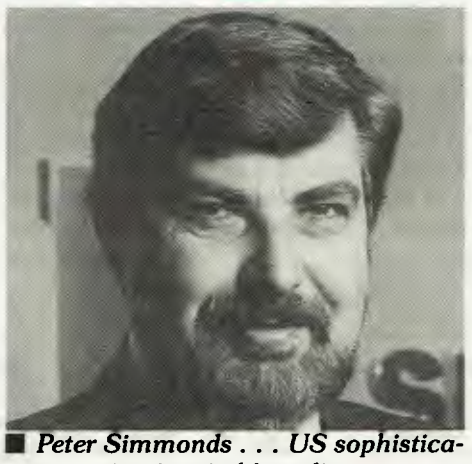
The addition of graphics to software such as Lotus has whetted the appetite of many users and is opening up new markets, particularly for business graphics.

Vendors of personal computer-based graphics systems are saying that things are looking good.

Vendors of highend systems are saying that things are quieter than they would like, but admit that the boom in PC sales can only open up their own markets.

Computer graphics has been accepted as a legitimate tool in most applications and, although acceptance varies from company to company, a computer site without graphics somewhere is unusual.

Because of the enormous diversity of use of computer graphics, it is difficult to pinpoint growth areas.



■ *Peter Simmonds . . . US sophistication is mind-boggling*

However, working on the basis that people who pay to go to a specialised conference are usually serious, we spoke to Ian Chandler, chairman of the West Australian branch of the Australasian Computer Graphics Association, which hosted this year's Ausgraph computer graphics conference and exhibition.

Chandler said three major interest areas stood out: geographic information systems, desktop or computer aided publishing and engineering Cad (computer aided design).

Geographic information systems (or land information systems) are growing in importance worldwide as a means of keeping track of vast amounts of data.

Several Australian authorities have already developed these. For example, Canberra's National Capital Development Commission (NCDC) recently bought a Vax-based system from Arc Cadcentre for work on what it said would rank among the six largest survey mapping and planning information applications worldwide.

NCDC has started with a planning atlas for the whole of the ACT. This provides a record of all planning and will, when complete, hold records of $120,000 blocks of land.

The NCDC said that the system will reduce by 20 per cent the amount of time now required to plan and release development sites.

Similarly, the Royal Australian Navy's

(Continued page 4)

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CONTENTS

The market is going in so many directions — with PC-based systems particularly strong — that

Stop, start jigsaw puzzle

(Continued from page 3)

Hydrographic Office is planning to manage the information collected on the 40 million square kilometres of ocean which make up Australia's area of charting and oceanographic responsibility.

The office had ordered a database system from Geovision, based on Hewlett-Packard hardware, to develop what will be known as the Hydrographic Information System (His).

In the desktop/computer aided publishing category, which is the flavor of the month, not only in Australia but in the US, Chandler said that there was great interest at Ausgraph from conference delegates and exhibition attendees.

A large percentage of Ausgraph 87 exhibitors showed desktop publishing-type equipment, both hardware and software, and there was strong interest, particularly from attendees with installed PCs, to add software, scanners and laser printers to their installations.

The rush, according to Chandler, has been encouraged by the high cost of printing, and the ease of use of current systems for preparing inhouse reports and other business material which merge text and graphics.

The third popular category, engineering Cad, was particularly interesting in view of the fact that it fared comparatively badly at last year's Ausgraph in Sydney. It is hard to know whether its popularity in Perth is geographically-based, or whether people are becoming aware it is now affordable.

Chandler found it particularly interesting that, on the whole, streams were evenly balanced as far as attendance goes. This may indicate the acceptance of computer graphics throughout business and government.

"Business graphics" as a category came off fairly poorly, in terms of numbers of session attendees, but this could be because it is starting to be seen not so much as a standalone entity but as part of a total business solution or as part of other applications such as desktop publishing.

Over the past few months, lowend system sales in all computer graphics applications have been healthy.

Peter Greenhalgh, manager, Technical Imports Australia, which specialises in PC-based Cad and business graphics systems, said he had not seen any slowing down of the market in the past 12 months.

He also said that the normal July, post-end-of-the-financial-year slump, had not occurred.

"In the first two trading days in July we took more orders than in any two week period this year," he said. "The sales were of all types of software, particularly our electronics design package, and of mice.

"There did not seem to be any one sector of sales," said Greenhalgh, "and there does not appear to be any change in the education/government/private enterprise mix over the past 12 months."

Proliferation

Greenhalgh believes that personal computers have become popular for graphics because of their low price, and the ease of introducing them into a company.

Buying a mini or a mainframe is a major decision which often has to be made at board level," he said. "But if you just want to micro to sit on your desk, the decision is usually done at a lower level, so it's easy for PCs to proliferate."

Greenhalgh also does not believe that PCs are just lead-ins for bigger systems.

"The market for PC-based graphics systems would not be interested in minis or larger machines," he said. "They want something they can control on their desks.

"When they grow they are not likely to grow into minis or mainframes, either. They will probably grow into a timesharing solution based on 32 bit machines, which still gives them their own desktop systems."

Greenhalgh's views were, to a certain extent, echoed by Harry Hvistendahl, managing director, Dimension Graphics, who said that technical advances in personal computers, particularly in relation to the business graphics market, had seen this sector grow at the expense of the more traditional mainframe solutions.

Hvistendahl feels, however, that when users decide they want more power, they are more likely to continue with personal computers and interface them with the mainframe.

"There is so much development going on in the PC area that some of the larger packages are falling behind," said Hvistendahl.

Dimension Graphics specialises in business graphics systems and markets software for personal computers and minis/mainframes.

Hvistendahl said that sales had been very good in the last quarter, although the company had sold comparatively less mainframe-based software, except for June when they sold more than in the past 11 months. Hvistendahl also feels that desktop publishing has opened up the business graphics market.

"Most desktop packages are weak in graphics," he said. "The sales surge in DTP has brought a backlash of people looking for good graphics to go with it."

Hvistendahl said business graphics have

suppliers must start to look at specific targets

always been seen as not directly productive and tend to be the first to go when budgets are cut.

"Conversely when there is money available the market picks up quickly, and this has happened over the past three months."

Sas Software's marketing manager, Brian Wood, said sales of the company's Sas/Graph business module had been steady.

Sas has not yet released its personal computer-based version of Sas/Graph, but it is expected to be available this year.

"There is a lot of pressure on us for the PC version from our existing users," said Wood. "People want to be able to use graphics at their desks.

"Managers may not have a graphics device allocated to them but would probably have a PC which can provide high quality graphics."

Sas/Graph is different from other software in that it is part of a statistical-based suite rather than a standalone package.

"People use Sas/Graph as an information tool after using Sas on the mainframe for analysis," said Wood. "But in line with requests from users, we have added tools to provide graphics for presentation.

"We are very responsive to user requirements and have noticed several major changes in the market since we started in 1982," he said. "Users are now more demanding and more sophisticated. They want much higher quality of output, resolution and the number of options.

"The quality of the text is also important," he said. "In 1982 you could get away with only having three or four fonts available. Our PC version of Sas/Graph will have a choice of 60.

"And the organisation of the average company has also changed," he said. "In 1982 you had a graphics department; now the users want their own machines on their desks."

The third major business graphics software vendor in Australia, Issco, is now part of Computer Associates.

Peter Simmonds, director of marketing for Computer Associates, said he was recently in the US for Issco Week, an annual event which attracts Issco users from around the world.

Sophistication

"The sophistication of business graphics over there is mind-boggling," he said.

"In Australia we get carried away with PCs, and our biggest problem is to get graphs to portray the true picture, because of a limited amount of data held in a PC compared to a mainframe.

"Management is now becoming aware, that it needs an accurate way of looking at trends, and graphics can provide this.

"PC graphics has whetted the appetite of a lot of managers, so they are now looking for more sophisticated information, and interest is high, which is starting to be reflected in sales.

"With organisations such as Telecom leading the way we expect that the use of business graphics will be more common in Australia by the end of this year.

"Many of the big tenders list graphics as essential, so interest really is picking up."

Mike Barraclough, marketing director of The TCG Group, also said that June had been excellent for sales, adding that he had been surprised that the election announcement had not affected sales.

"Usually an election is a good excuse for not doing anything, but this time it has made no difference," he said.

TCG was one of the first companies in the computer graphics market in Australia and now specialises in graphics hardware such as plotters, digitisers and terminals.

Barraclough agreed that the PC market was going well, particularly for Cad products such as Autocad.

However TCG is now looking more towards the highend of the computer graphics market.

"We are looking at graphics for areas such as industrial design, animation, and simulation applications," Barraclough said.

So the experts' views differ on exactly what direction the computer graphics market will take, but one thing is certain: The days of thinking computer graphics is a fad are over.

● *Robyn Hughes is a Sydney-based freelance journalist specialising in computer graphics. She was one of the founders of Australia's first computer graphics magazine.*

■ ***Brian Wood . . . users now more demanding and sophisticated. Mike Barraclough (right) . . . PC market is 'going well'.***

Architects, designers and engineers went to Washington recently to view a graphics exhibition.

Descon a big draw to diverse delegates

MORE than 22,000 delegates, including a group representing Acads (Australian Computer Aided Design Society), were registered for the A/E/C Systems Show, part of Descon'87, the International High Technology Design and Construction Fair recently held in Washington. The 412 exhibitors filled 13,000 square metres of floorspace and the attendee list was a mix of architects, designers and engineers from companies of all sizes. Many said they were attending the show for the first time to see how computers could help their businesses.

Among the exhibitors, Apple, whose Australian base is North Ryde, NSW, displayed more than twenty hardware and software products from various developers for use on its Macintosh personal computer family. These included products from Challenger Software, Data Tailor, Erez Anzel Software, Visual Information, Versatec (represented in Australia by Anitech of Lidcombe, NSW) and Abvent. Hewlett-Packard demonstrated its plotters for use with the Macintosh II and the Macintosh SE PCs. Autodesk, the US-based Cad software leader, with a recently formed subsidiary in Richmond, Vic, announced, however, that it has no plans to port its software for the Macintosh, although the Apple machines and all other hardware platforms were being closely watched.

Other products announced at the show included an enhanced-facilities management software package from Prime Computer, whose Australian operations centre on North Sydney. Expanded FM Plus 3.0, based on Prime information data management environment software, FM Plus, comprises four models addressing the planning, management and analysis needs of facilities managers and designers. FM Plus operates on all terminals supporting the Graphical Kernel System, and will sell for $US20,000 for the base module on a small system to $US60,000 for the complete module on a highend system.

Prime was also displaying third party products from Arc/Info, whose products are distributed in Australia by Arc Cadcentre in Melbourne, and a document scanner from graphics systems specialists, Tektronix. The Australian arm of Tektronix is in North Ryde, NSW.

Fujitsu America's Information Dsystems Division unveiled its Engineering Library for Modelling (Elm) for structural engineering analysis. The Australian company, in North Sydney, was unable to provide details of the availability of the product for Australian users. It is a PC-based three-dimensional finite element analysis package which sells for $US3,990.

Compressed image

GTX Corp, unrepresented in Australia, announced the GTX 125S Raster Image Editor which can revise scanned drawings in raster form. Operating from a compressed image file allowing for fast and large drawing editing, a typical edit server comprising a Sun Microsystems raster-edit workstation with 141M-bytes of storage and software, costs around $US44,000.

Logigraphics announced Conception 3D, a design package running on the RGS Graphics Subsystems for the IBM PC and PC AT. It is claimed to have applications in manufacturing, engineering, architecture, design, schematics and training and costs $US4,000.

Still on the software front, Sigma Design introduced Release 5.5 of its Unix-based software for architects and building design and management professionals and has renamed its software family Arris. Previously known as Cad Solutions, Arris 5.5 incorporates a new user interface and space planning application called Space Design. Prices for Arris 5.5 start at $US3,000.

A new graphic controller from Control Systems, the Artist 10/1280, claims to boost the resolution of AT Cad systems to 1280 × 1024 pixels. The single slot board includes 2M-bytes of display memory and sells for $US3,795.

Isicad, formerly Calcomp's Systems Division and represented in Australia by Datamatic of North Ryde, NSW, announced a high-performance workstation called Prisma which claims to offer a fully functional Cad solution. Targeted at professionals in the fields of architecture, engineering and facilities management, the workstation supports Isicad's family of applications software and as many as 16 Prisma workstations can be connected to a single host.

At the show, an ACS Telecom 10Cad Plus Network linked a number of exhibits to demonstrate connectivity — they were linked with more than one mile of cable.